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COMPUTERWORLD

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In Depth
Cost control: DP refuses to play by the rules/**77**

Executive Report
Big-money federal contracts lure systems integrators/**51**

Feds will control data access

A matter of time, official says amid cries of 'foul'

By David A. Ludlum

NEW YORK — A U.S. Department of Defense official predicted last week that the federal government will inevitably place controls on access to on-line data bases in order to protect national security.

"The question is not, 'Will there be restrictions or controls on the use of commercially available on-line data bases?'; the question is, 'How will such restrictions be applied?' " said Diane Fountaine, director of information systems for the Office of the Assistant Secretary of Defense for Command, Control, Communication and Intelligence.

Fountaine's comments drew critical opposition from industry representatives who joined her at a panel discussion on control of access to data bases during the annual conference of the Information Industry Association, a trade group representing vendors of information services. Others on the panel warned of dangers in restricting access to such services.

"Any change in the present status of unrestricted and open access to general information data bases raises major First Amendment issues," said Ronald L. Plesser, an attorney with the Washington, D.C., law firm Blum, Nash & Railsbach and former general counsel to the U.S. Privacy Protection Study Commission.

The issues should be considered by Congress, Plesser said, calling for strong opposition to any restriction of the free flow of public information.

The controversy stems from a 1984 Reagan administration national security direc-

See **FEDS** page 4

Guessing IBM's PC game stirs fear in Las Vegas

By James A. Martin

LAS VEGAS — Uncertainty over IBM's Personal Computer strategy has users holding back on buying the existing crop of "compatible" machines based on the Intel Corp. 80386 microprocessor.

Despite IBM's pronouncements last week that future IBM PCs will be open to software developers, speculation was rampant at Comdex/Fall '86 that IBM's coming hardware designs may close out clone vendors.

Comdex news, pages 12 and 13.

"I can't recommend 386 because I don't know what IBM's going to do," said Geoffrey Campbell, information center specialist for the Rocketdyne division of Rockwell International Corp. in Canoga Park, Calif. Even upgrade boards are costly and less than ideal, he added. "They're less powerful, and they don't have the full memory," Campbell said.

IBM PCs under development will remain open to third-party software developers, IBM Entry Systems Division President William C. Lowe said in his keynote address at Comdex.

"We will continue to support open-architectured interfaces for application providers to write to," he said against a backdrop of numerous 80386-based system announcements.

Analysts and observers agree that IBM product rollouts next year, expected to include more advanced Intel 80286-based machines as well as an 80386-based line, will be ripe for software development. But many also believe they will be incompatible with existing 80386-based micros that have been announced by Compaq Comput-

See **GUESSING** page 10

TOP OF THE NEWS

Taking on minicomputer vendors, Ungermann-Bass is adding to its multivendor networking line. **Page 5.**

■

Ameritech decides five MIS operations are better than one. **Page 2.**

■

Unisys wins out over Sparrow and others in the Burroughs-Sperry name contest. **Page 146.**

■

Autofact attendees decry lack of progress on MAP. **Page 8.**

■

Computer-rooms-to-go ease the burden on expanding MIS operations. **Page 83.**

■

The Reagan administration has issued a memorandum that gives agencies the power to apply a new "sensitive" desig-

See **NEWS** page 5

Computer Assoc. on buying spree

By Clinton Wilder and Charles Babcock

GARDEN CITY, N.Y. — Setting its sights on becoming the industry's first billion-dollar independent software company, Computer Associates International, Inc. last week proposed its second major acquisition in as many weeks.

Computer Associates signed a letter of intent to acquire the General Electric Co. subsidiary Software International, Inc., which rang up $35 million in revenue in both 1985 and 1986.

Although the price was not disclosed, analysts estimated Computer Associates will pay from $25 million to $40 million

See **COMPUTER** page 143

CW SPECIAL REPORT

Fire consumes Steinberg, Inc.'s headquarters.

Hot sites: Disaster plan douses flames

By Donna Raimondi

MONTREAL — When fire struck a $4 billion company's headquarters here late last month, computer operations transferred to a disaster recovery hot site and became operational within two days after the mainframe computer room was shut down.

A disaster recovery plan completed two months before flames destroyed much of Steinberg, Inc.'s corporate headquarters allowed the most critical applications — a 28,000-employee payroll and store billing jobs — to be brought up within two days. Most other business applications and development projects were running within a week after the fire. Despite temporarily losing use of the company's IBM 3090 Model 200 mainframe and access to the 13 communications lines in the computer facility, none of the software or data needed to do business was lost, says Marcel Croux, vice-president of information systems.

Because the Steinberg disaster recovery team was notified of the fire immediately and because the fire was in an adjacent tower and did not actually touch the computer rooms, personnel were able to get into the computer facility to do a final tape backup, cover the mainframe before water poured on it and rescue paper

See **DISASTER** page 6

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NEWSPAPER

Five MIS units reaching out in Ameritech's regional plan

By Jean S. Bozman

CHICAGO — Ameritech has forged a new MIS strategy: Five information systems departments are better than one. This approach, formalized last week, has resulted in reduced operating costs and leveraged the resources that service its operating companies in five Midwestern states.

The company, one of the seven regional holding companies, will maintain decentralized operations within Illinois Bell, Michigan Bell, Ohio Bell, Indiana Bell and Wisconsin Bell. Each information system organization will continue to operate independently, but each will also, according to Ameritech directives, agree to maintain certain systems so that the others will not have to reinvent the wheel.

Among the systems are a payroll system from Wisconsin, an Ohio billing system, an office automation system from Michigan and an Illinois-developed carrier-access billing system.

In a way, says Robert Prothero, vice-president of information systems technology for Ameritech, the company was more fortunate than most of the other six regional holding companies. "Our opportunity was greater than any of the other regional companies' because we started out with more," Prothero says. "We can pick and choose among the systems they have developed to get our work done."

> ***'Our opportunity was greater than any of the other regional companies' because we started out with more. We can pick and choose among the systems they have developed to get our work done.'***
>
> — Robert Prothero, Ameritech

Ameritech Services, Inc., an Ameritech subsidiary that coordinates all companywide activities, has encouraged decentralized operations, Prothero says.

Toward that end, the central Ameritech holding company in Chicago has established remote Ameritech Services offices throughout the Midwestern telephone companies to support what are considered to be strategic systems.

Resources shared locally

By having each operating company support the strategic system it knows best, information systems resources are both shared and retained locally. The information systems organization that writes a system will have the job of maintaining it and updating it for the other four divested Bell operating companies. Further, the software developers will not have to move to Chicago — something made possible by Ameritech's advanced networking communications.

"We have learned that there's an economy to central development of a system," says Earl Ross, general manager for Michigan Bell Management Information Services.

"But we run the systems locally, since there's no economy to running them centrally," Ross adds.

Frequent meetings of Ameritech Services panels involving information systems managers from each of the five states will agree on communications protocol or functionality standards, Prothero says. But each company has its own information systems environment: Michigan mixes Burroughs Corp., Sperry Corp. and IBM equipment, whereas Wisconsin is an IBM shop, and Illinois Bell has a lot of Sperry equipment.

For this reason, specific hardware or software choices will not be made by Ameritech's central office in Chicago. "We're trying to get connectivity, but we're not trying to dictate specific hardware," Prothero says.

Since applications systems that originated on one type of computer architecture may have to be run on incompatible systems in another state's telephone company, they have to be recompiled or rewritten by the originating information systems group.

Sharing resources, however, is just one way Ameritech would like to get the maximum productivity from its constituent information systems groups. The other is to get them to encourage end-user computing — pushing the development of applications closer to those who will work with them.

The goal, Prothero says, is to get end users to take more control of applications development. "We are trying to get champions of end-user computing throughout the organization."

Michigan Bell's Ross, who is in charge of developing end-user support systems throughout Ameritech, says he would like to see information systems develop into a kind of data base support service over the years. That would leave most routine development of applications to end-user departments.

"As an information systems manager, I want to reduce my developmental costs," Ross says.

"And, by encouraging people to use such fourth-generation languages as Focus, Ramis and SQL, information systems can become a data base organization by 1995," Ross explains.

The end result, Ameritech hopes, will be to present a united front to information systems customers while allowing a great deal of diversity in end-user systems. That approach will free information systems from some of its more routine and time-consuming tasks.

Says Prothero: "Our attitude is, 'Let's do things once in a common manner and standardize on those systems that do the job best.' "

Bozman is a Computerworld contributor based in Chicago

In this issue

NEWS

IBM assists in developing Carnegie-Mellon campuswide network/ **4**

Ungermann-Bass to unveil major corporate network products at Localnet/ **5**

After fire disaster, Steinberg employees offer advice on developing MIS recovery plans/ **6**

Vendors ready for products based on new MAP version, but Autofact offers little/ **8**

Page 51

System downsizing trend highlighted at Autofact/ **8**

Kodak introduces 14-in. optical disk prototype, hints at media standardization/ **12**

FCC raids Comdex for uncertified computer equipment/ **12**

Vendors unprepared to ship most 386 products shown at Comdex/ **13**

IBM puts own expert system to use to reduce costs/ **14**

Channel extender speeds IBM-compatible mainframe communications/ **15**

SYSTEMS & PERIPHERALS

Sperry forms IBM data link with 3480-type cartridge/ **19**

3090 to accommodate eight CPUs by '87, research firms says/ **19**

IBM seeks to provide enterprisewide services/ **19**

SOFTWARE & SERVICES

Insurance companies implement Syntelligence expert system/ **27**

Package uses Cobol to ease CICS application development/ **27**

COMMUNICATIONS

Open architecture, SNA connectivity are topics at recent IBM meeting/ **35**

Fox LAN offers fiber-optics option on board/ **35**

Telenet completes data network service unit of Sprint/ **35**

MICROCOMPUTERS

Seattle telecom boosts PC AT with 386-based expansion board/ **43**

Macintosh acts as Unix workstation with Eurosoft shell/ **43**

Datacopy strives to create electronic imaging standard with debuts/ **43**

MANAGEMENT

Chargeback helps cut systems spending at Georgia Power/ **83**

Specialized firms build data centers to meet tight deadlines/ **81**

COMPUTER INDUSTRY

IBM to close parts center, cutting staff of 1,000/ **146**

Despite weak year, Concurrent maintains belief in parallel processing/ **118**

Lucrative federal OA mart has vendors signing up/ **144**

Burroughs-Sperry decide on name/ **144**

After Ansa appointment, Posner argues for use of small software development teams/ **144**

EXECUTIVE REPORT

Systems integrators continue to win high profiles and big government contracts. Their role in the commercial sector, however, is yet to be determined. By Jeffrey Tarter/ **51**

IN DEPTH

Programming generation gap: Despite advanced DBMS technology, applications designers still rely on outdated techniques. By Daniel Nolan/ **67**

Economic anarchy: Many MIS managers have yet to learn the first rule of economic reality — cost control. By J. Robert Riggs/ **77**

OPINION & ANALYSIS

Newquist on disposable computers/ **17**

Connolly sorts out rumors and truths of 9335 performance/ **19**

Babcock questions recent IBM-Hogan deal/ **27**

Rosenbaum on AT&T strategy to phase out computer business/ **35**

Zachmann analyzes Windows' success/ **43**

Couger on making end-user computing successful/ **83**

Martin on Japan-U.S. partnership in chip industry/ **144**

DEPARTMENTS

Page 16

Editorial/ 16
Calendar/ 84
New Products/ 91

PAGE 17 ILLUSTRATIONS BY ALAN WITSCHONKE

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University develops campuswide network

Carnegie-Mellon to link 7,000 students, faculty

By Eddy Goldberg

PITTSBURGH — Carnegie-Mellon University last week inaugurated a campuswide distributed computing network that will link 7,000 students and faculty when completed in the next two to three years.

The system, named "Andrew" after university benefactors Andrew Carnegie and Andrew Mellon [CW, Feb. 3], is a computing and communication system for universities and is being developed with financial and technical assistance from IBM, which owns Andrew.

University President Richard M. Cyert, who created a task force in 1981 to look into the role of computing in all aspects of the university's activities, said he expects Andrew will be seen as "one of the most significant moves in education during this century."

Exchange and receive

For example, students and faculty on the network will be able to exchange electronic mail messages, call up bulletin board notices, receive and complete course assignments, write research papers, retrieve data base information from files, libraries and campus directories and receive course instruction.

The campus has been rewired with 300 miles of fiber optics and IBM Cabling System wiring at a cost of approximately $6.5 million, according to Walter Schymik, coordinating manager of the Carnegie-Mellon study for IBM's Academic Information Systems business unit. There are more than 10,000 connections now in place in approximately 50 campus buildings.

The heart of Andrew is the software, which is intended to provide campus network users with access to computer-based education, research and administrative applications. "It consists not only of a network file system environment but also the windowing interface — a common user interface to the system," said Tony Schaller, manager of systems development for administrative systems at Carnegie-Mellon.

Andrew "starts out with the point of view that graphics is the basic unit of presentation," Schymik said.

Andrew, now in its fourth year, is a $35 million project involving some 10 people on assignment from IBM and about 20 more people from the university's Information Technology Center. IBM has provided most of the hardware and funding for the project, including the cabling and approximately 250 to 300 IBM RT Personal Computer 32-bit workstations.

Approximately 30 universities are using Andrew in its present form. IBM will make Andrew available running on its Academic Information Systems 4.2 for the IBM RT PC in the last half of 1987.

University commitment

Despite IBM's heavy involvement, the university is committed to a multivendor, heterogeneous environment and uses equipment from many different manufacturers, Schaller said.

The university's network is being converted from Ethernet to IBM Token-Ring technology, with the two networks communicating via Transmission Control Protocol/Internet Protocol, Schaller said. He said the university is also involved in a five-year technological partnership with Relational Technologies, Inc. to explore the concept of a distributed data base in an administrative environment (see story page 27).

"When we finish building our distributed system, we'll be three to four years ahead of commercial MIS," he said.

Feds to control data access

From page 1

tive authorizing the Defense Department to study control of data bases that contain "sensitive but unclassified . . . government-oriented" information [CW, July 8, 1985].

Last fall, U.S. Secretary of Defense Caspar Weinberger issued a report, calling data bases fertile ground for Soviet intelligence agents [CW, Sept. 30, 1985].

At last week's discussion, Jack W. Simpson, president of Mead Data Central, Inc., a leading data base firm, referred to visits he and colleagues have had from officials of the Department of Defense, the Federal Bureau of Intelligence and the Central Intelligence Agency inquiring about controlling access to their firms' data bases. Until one has received such visits, "you can't appreciate the true extent of the issue," Simpson said.

Government officials contend that through gathering and processing unclassified data, computers can create information that could be considered classified, Simpson said, elaborating on his panel discussion comments.

Mead Data Central contends classified information has been released in "bits and pieces that slipped through the cracks" and that the government should control it more carefully.

Also criticizing the idea of restricted access to data bases was Jerry Berman, chief legislative counsel for the American Civil Liberties Union. Berman said the U.S. is "moving more and more toward the militarization of the flow of scientific information" and thereby jeopardizing freedom.

A more moderate, positive stance was taken by Jean Pierre Chamoux, an official of the French Ministry for Postal and Telecommunications Services. He called for the editing of sensitive information from data bases before they are made commercially available rather than restricting access, which he said would be impractical.

An Information Industry Association official, Kenneth B. Allen, said Fountaine's remarks reinforced the group's concerns with the Defense Department's position and that the IIA would continue to push for a policy balancing national security with the right of access to unclassified information.

"The right of citizens to obtain unclassified, public information is a fundamental right of a free society," Allen said. "The IIA board of directors will address this issue at its December board meeting."

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Ungermann-Bass augments net line, takes on mini vendors

Workstation makes PC a mainframe link

By Elisabeth Horwitt

SAN FRANCISCO — During Localnet '86 held here this week, Ungermann-Bass, Inc. is scheduled to add several major products to its multivendor networking line and engage minicomputer vendors on the battlefield of corporate communications.

With the announcement of the Universal Workstation, along with several network-to-network bridges, Ungermann-Bass has made a much stronger commitment to the corporate marketplace, said Darrell Miller, director of product marketing.

The Universal Workstation series offers added communications functionality for a group of IBM Personal Computers connected via Microsoft Corp.'s MS-Net version of Ungermann-Bass's Net/One Ethernet local-area network (LAN). The product targets firms whose users "often are forced to have an IBM PC with an Irma card [terminal emulation board from Digital Communications Associates, Inc.], a VT100 and a 3270 terminal all on the same desk," Miller said. As a communications server supporting a range of terminal emulation modes, the workstation enables a networked PC to replace most standard terminal devices, he added.

The workstation series consists of two hardware and four software components that convert an IBM PC AT or Intel Corp. 80386-based host computer to a Net/One PC server, performing micro-to-mainframe communications for other networked PCs.

With the Net/One PC, which consists of an operating system and NIUPC adapter card, Ungermann-Bass is challenging minicomputer vendors in the departmental processor arena, Miller said. Incorporating an 80186 CPU and an Ethernet coprocessor, the NIUPC converts a microcomputer into a communications server that can support up to 96 concurrent user sessions, which, Miller said, is competitive with most minicomputers. Ungermann-Bass's previous network server could only support 32 sessions.

Ungermann-Bass's announcements offer users added connectivity that many big systems do not yet provide, said David Terrie, president of Boston-based Newport Consulting.

But Ungermann-Bass's sally into the corporate networking arena may run headlong into "the threat that IBM, DEC and the others will provide their own multivendor support," Terrie added.

By supporting emerging industry networking standards such as the International Standards Organization's Open Systems Interconnect, companies such as IBM, Digital Equipment Corp. and Wang Laboratories, Inc. will soon provide multivendor connectivity on a higher level than offerings from independent networking vendors such as Ungermann-Bass, Terrie said.

Other added features offered by Net/One PC include support of diskless workstations and a validation service that requires PC users to log on before gaining access to network resources.

The NIUPC is priced at $1,095 for the baseband version and $1,745 for the broadband version. The 3270 NIUPC costs $1,495 for baseband and $2,145 for broadband. The Net/One XNS Netbios add-on, which adds full compatibility with applications developed for the IBM PC Network interface, is available for $35.

TOP OF THE NEWS

NEWS from page 1

nation to certain data held in federal information systems and to take steps to prevent disclosure, according to government sources. Sensitive information would include a wide range of unclassified data about national defense, foreign policy, business and technology that would harm U.S. interests if obtained by adversaries.

■

Unlimited site licenses have been announced by Software Products International, developer of Open Access II Network Software, an integated package, and Alpha Software Corp., developer of Alpha/3 data base software. Software Products' program allows unlimited access to its Network system for $3,995. Alpha now offers an unlimited site license for $275,000.

■

Digital Equipment last week slashed the price of the mainstay of its terminals product line, the VT220, by 27% to $795. According to DEC, demand has allowed economies in manufacturing and distribution.

■

Honeywell announced late last week it will buy the Sperry Aerospace Group from Unisys Corp. (see story page 1) for $1.025 billion in cash, a price significantly higher than expected. Honeywell originally offered $700 million for both the aerospace and the much smaller marine system units of Sperry [CW, Sept. 1].

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Disaster plan douses flames

From page 1

documents that were not backed up off-site. If the fire had been in the computer room, mainframe data could have been recovered because it was also stored off-site, but the company would have lost valuable IBM Personal Computer diskettes and paper documents.

After the extent of the disaster was realized at noon on Oct. 27, Steinberg employees transported their operating systems — IBM's MVS running under VM/XA and a few old DOS versions for batch jobs left over from the IBM 3033 the company ran before it installed the 3090 in January 1986 — to Comdisco Disaster Recovery Services, Inc.'s (CDRS) Carlstadt, N.J., site and within 24 hours had them operating on CDRS's IBM 3081 Model K. Within 26 hours of the fire's discovery at 6 p.m. on Oct. 26, Steinberg's entire 25-person disaster operations team had all left Montreal for New Jersey. By 4 p.m. on Oct. 28, the operating systems and all of Steinberg's critical systems were running at the New Jersey hot site.

The IBM IMS data base lost nothing, Croux says, because the fire was on a Sunday and everything had been backed up and stored off-site before the fire. To ensure they had the latest version, Croux and his team backed the system up again during the early stages of the fire so it would be as up to date as possible and transported all the backup tapes to New Jersey by 6 a.m. Tuesday.

Source code up to date

Source code for all programs was regularly kept up to date, backed up daily and stored off-site, so current versions of all software were available. Even so, Steinberg was lucky in some respects. Had the fire happened on a Monday night, the critical payroll would have been delayed. "We had prioritized all applications and knew what would be running each day of the week, so we were prepared for a disaster on any day," says Richard Brown, DP security officer. "Still, the timing was perfect. We were almost accused of setting the fire to show how well the plan runs."

Marcel Croux

The only hitch, according to Croux, was that IBM PC users in the company had no off-site backup, so their data was lost. Fire department personnel allowed Croux to enter the MIS building to remove hard disks from PCs used in a 30-programmer development project to revamp the firm's distribution software.

Croux's advice to corporations: Store paper documents and PC backup, not just mainframe data, off-site. Although MIS did not lose all that development work because they could remove the disks, other areas in the company that actually burned, such as the legal department, lost all PC and paper records not stored on the mainframe.

Flames that destroyed several floors of the high-rise headquarters building did not touch the computer room, but the event left MIS with an inch of water on all the floors, sooty water dripping from the ceiling, no electricity for 48 hours and burned-out communications facilities. Smaller computer centers for Steinberg's real estate division and for other companies that rented in the building were destroyed, Croux says. Operations moved back to headquarters Nov. 9, although development personnel are still working in the Montreal cold site.

"Being centralized, we knew we were vulnerable to any type of disaster," Croux says of his decision four years ago to institute a disaster plan. "We do millions of transactions a day. Large corporations like ours are critically dependent on information services. It would be almost impossible to go back to manual services," he says. If MIS managers have not been able to convince top management that disaster recovery is critical, they should not let go of the effort. "Make them aware of what can happen. Don't take 'no' for an answer," Croux says.

Subscribing to the Comdisco service costs Steinberg $3,000 (Canadian) per month for the Montreal cold site, a shell area that company employees can work in if disaster forces them out of their building, and $5,000 (U.S.) per month for the hot site, an area set up with a mainframe, communications and all the necessary equipment and goods to run the company's business during recovery. During the time of disaster, use of the facilities costs extra.

Brown, the company's DP security officer, works in an administrative DP function because Croux determined that disaster recovery, left in the hands of MIS technical services or operations people who always have other priorities, would not get the high priority treatment it deserved. "We put a lot of money in this, so I figured if something happened and we weren't prepared, we'd be in trouble," Brown says.

Companies should not just subscribe to a disaster service and trust that all will work well if needed. Comdisco reacted quickly and professionally to the disaster, Croux says. The company not only provided the mainframe facilities but arranged for hotel reservations, office supplies, spending money and even toothbrushes for Steinberg MIS crews who arrived at the New Jersey hot site with no time to pack their clothes.

Steinberg employees worked continually since starting the project in 1982 to plan, implement and test the plan; the company became a subscriber to CDRS's Carlstadt services in August 1985. Brown and his boss, Francois Arbique, manager of administration in DP, attended classes in disaster recovery both at Comdisco and at computer conferences, joined a disaster recovery users group in Montreal and paid close attention to lessons learned in three actual tests of the plan during the six months prior to the fire.

Tests critical

Everyone involved in the plan agrees the tests were critical. When Steinberg decided to truck its 10,000 magnetic tapes to New Jersey from Montreal the day after the fire, it knew how to deal with customs officials. During the three tests, customs officials were not eager to allow a moving van full of tapes, hurrying in the middle of the night, to pass through from Canada to the U.S. So when the real thing happened, the president of Steinberg eased the way by calling the customs chief to explain why it was necessary.

Although there is no tax or duty on magnetic tapes, the tapes need to be declared. They require a bond posted and an invoice that states their value, according to U.S. Customs Import Specialist Dorothy Sheehan. "There should be no problem transporting computer tapes, unless there is a question about whether it is copyrighted material. Customs may or may not go through all the tape boxes depending on whether we have questions," she explains.

As a result of the fire, a few modifications will be made to the disaster recovery plan. Communications lines will be changed so that all lines are compatible between the U.S. and Canada (see story at right). Outside storage of paper documents and PC backup will be arranged and documentation on how to bring the system up in New Jersey will be revised. But the plan has to have flexibility, Brown says. Steinberg was lucky that the disaster occured on a Sunday, he says. "Each day of the week would make it different, because applications are more or less critical on different days. Payroll is critical on Tuesday, but on Wednesday it is not."

Steinberg employees pack tapes in Carlstadt, N.J., for the return trip to the Montreal data center.

Girding for catastrophe

MONTREAL — MIS managers should commit to a disaster recovery plan, develop it internally and test procedures often.

This advice comes from the key employees involved in Steinberg, Inc.'s successful recovery from a headquarters fire.

"We learned from each of the three tests we did," says Richard Brown, data processing security officer and the man in charge of the disaster recovery implementation for the $4 billion Canadian retailer. The teams Brown had put together over the past few years reacted quickly and effectively to the emergency because there were few surprises, he says.

MIS can convince top executives to support disaster recovery by pointing out what would happen if there were no plan. "For a company our size, one hour of downtime will affect the organization. After two days, stores won't get the right merchandise and billing will be fouled up," says Marcel Croux, Steinberg's vice-president of information systems.

Be prepared

Always be prepared, say Jean Pujolle, director of technical services, and Ted Papadakis, shift operations manager. Papadakis and Pujolle were first and second in line to be notified when the disaster occurred, and both worked without sleep during the first two critical days. Operators, technical service and communications personnel should be trained well, no matter what the expense, because the actions of the first day or two are critical to success.

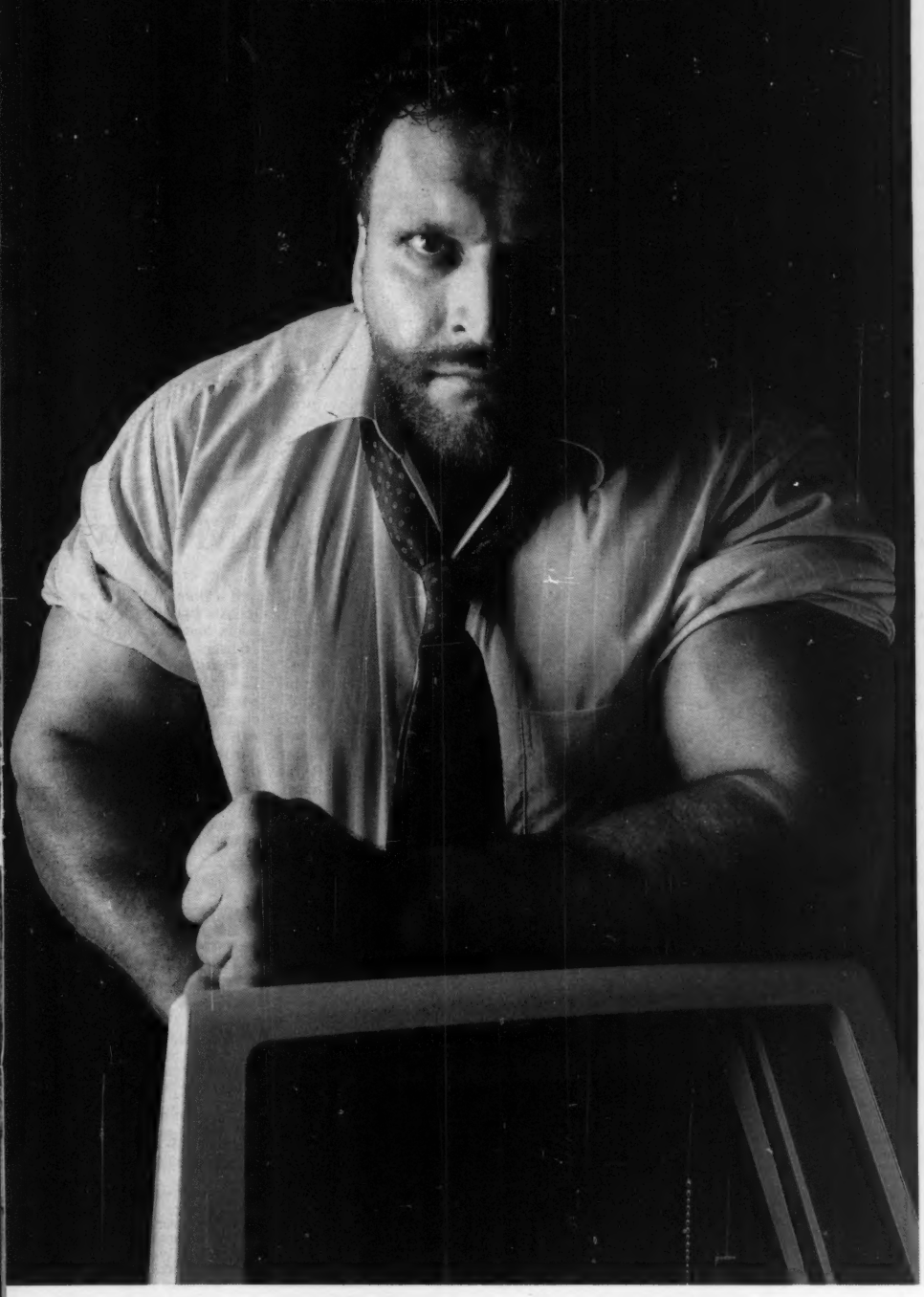
"Know how to spread your people out," Papadakis says. Steinberg knew enough to send the junior VM expert to bed during the first 12-hour shift while the senior VM expert worked to bring the system up. "We discovered this during our third test, when we burned them both out at once," Papadakis explains.

The network the company uses day to day must be compatible with the recovery plan, because there is no way to change it quickly when disaster strikes advises Yvon Berube, director of retail automation. "We had Bell Canada Enterprises, Inc.'s Datalink switched digital network, an entirely digital network, running to two of our stores. We discovered that none of the communications facilities in the New Jersey hot site were compatible," he says. Fortunately, Bell Canada moved very quickly to provide usable lines, something that could not have happened if dozens or hundreds of the stores were using Datalink.

Although Berube was happy with the Datalink product, he will reconsider its use now. "It's a trade-off between the ideal product and what works when you need it," he says.

— Donna Raimondi

Taming the wild end user.



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NEWS

Wait for MAP Version 3.0 casts dark shadow at Autofact

By Elisabeth Horwitt

DETROIT — An expected wait of at least one year for Version 3.0 of the Manufacturing Automation Protocol (MAP) dramatically limited MAP-related customer interest and vendor product announcements during Autofact '86, held here last week.

MAP, a subset of the emerging Open Systems Interconnect (OSI) communications standard geared to the manufacturing sector, was the star at last year's Autofact, in which a multivendor prototype MAP network dominated the conference floor. This year, attendees expressed dissatisfaction with vendor offerings that still incorporated the current MAP Version 2.1 and appeared to offer little advancement toward true multivendor interoperability.

Autofact attendee Donald Hopings, a process control engineer at Libbey-Owens-Ford Co. in Toledo, Ohio, said his company is currently using Digital Equipment Corp.'s Decnet communications products to handle data flow through various production levels. "We're considering MAP, but it really isn't there yet," Hopings said. "Right now, Decnet can do the job."

"Vendors are saying that they have the only or the best full implementation of MAP, but what use is that without interoperability with other vendors?" commented Bharat Thacker, a consultant at Universal Computer Applications in Southfield, Mich. The industry is still far from multivendor connectivity even at the bottom layers, he added.

MAP-related announcements

Two vendors made MAP-related announcements during the show. DEC announced the VAX DEC/MAP, which implements MAP 2.1 protocols on all VAX Unibus and VAXBI bus computers under the VMS operating system.

The MAP implementation includes all seven layers of the OSI protocol, including the following application interfaces: Common Application Service Elements (CASE), which provides peer-to-peer, program-to-program communications; Manufacturing Messaging Format Standard, protocols for communications with controllers and robots; and File Transfer Access and Management (FTAM), which establishes virtual program-to-program circuits for file transfer.

DEC also announced MAP Control Program and Directory Services/Client Services Agent network management tools that currently do not exist as MAP specifications. A DEC spokesman said the company hopes that the protocols "will become the de facto standard."

VAX DEC/MAP costs $12,000 to $16,500, depending on the system. Deliveries begin in January.

At last week's meeting of the MAP standards committee on the subject of MAP Version 2.1 to Version 3.0 migration, Industrial Technology Institute (ITI), an Ann Arbor, Mich., organization that tests for MAP conformance, reportedly responded to 80 complaints that DEC had made of ITI's conformance testing facilities. According to Thacker, who attended the meeting, ITI said that 65 of DEC's complaints "required no action" on its part. The nature of the complaints was not revealed at the meeting.

At the same time, Honeywell, Inc. announced ITI's certification of full MAP 2.1 compliance for some of its products but complained that ITI still could not provide interoperability testing. "We are certified for MAP conformance and interoperability by ITI. But who can prove interoperability until other companies' products are certified?" asked Wayne Kahn, director of research and development for Honeywell subsidiary Digital Datacom, Inc. "We won't go back to ITI until others finish their conformance testing."

Honeywell announced the controlled release of its MAP 2.1 software package for the DPS 6 minicomputer line. The software includes FTAM and CASE. Kahn said that customers can now buy ITI-certified MAP 2.1 software on the Honeywell Workforce 1250.

Scheduled for early 1987 is the availability of certified MAP 2.1 software for the Work Center Manager, also introduced last week. Based on the Charles River Data Systems, Inc. Universe/VME, the system performs production management and control at cell and supervisory levels. Prices range from approximately $100,000 to $250,000.

System downsizing becomes order of the day in Motown

Price, flexibility stressed by users

By Rosemary Hamilton

DETROIT — The computer-aided design, manufacturing and engineering (CAD/CAM/CAE) industry showed few technological advances last week at Autofact '86.

Instead, Autofact was evidence of the ongoing trend toward downsizing in the industry, a movement that began with the introduction of the first workstations in the early 1980s. Last week, the number of hardware vendors responding to this trend grew as more Motorola, Inc. 68020 and IBM Personal Computer AT-based systems were offered to users.

"I guess the real changes will be next year when Motorola and Intel Corp. start shipping the next generation of microprocessors," said Anand Naidu, director of engineering at Faraday Electronics, Inc., a maker of board-level systems for the industrial marketplace.

The trend toward smaller systems has been driven by "cost and the need to provide flexibility," said Keith Wheeler, vice-president of engineering at the Integrated Systems Technology division of Litton Industries, Inc. "Four or five years ago, we had big systems that did a particular function," he said. "Now, price and flexibility are key issues, and vendors have to respond."

Among those vendors offering workstation products were Control Data Corp., NEC Information Systems, Inc. and the Computer Systems Division of Harris Corp.

Data General Corp. announced an enhanced version of its IBM PC AT-compatible Dasher/286 system, which will be sold as an engineering workstation. Aries Technology, Inc., a start-up firm, announced a PC AT-based system for solids modeling.

One user applauded the fact that more vendors are providing smaller CAD/CAM systems. Doug Wine, MIS manager for the Adolph Coors Co., said he will be overseeing both the information systems and CAD/CAM systems at a new Coors facility in Virginia. "I'm thinking that at this facility, which is a little smaller, if we had to get a big system, there'd be the possibility that we wouldn't need the whole thing," Wine said. "So for me, since I'll be responsible for CAD/CAM, I think this trend is great."

Other CAD/CAM/CAE announcements last week included the following:

- Apollo Computer, Inc. introduced the Domain 5080 Emulator, a hardware and software package that allows users to display IBM mainframe software in a workstation window. The product provides IBM 5080 emulation. Offered as a bundled system with interface boards and a Domain DSP90 server, it costs $44,500 for up to four users and $54,500 for up to 16 users.
- Boeing Computer Services Co. announced Axxyz, a software package for mechanical applications that it will offer on a variety of hardware platforms, including the IBM 4300 series and the Digital Equipment Corp. VAX line. Consisting of seven modules, Axxyz starts at $6,000.

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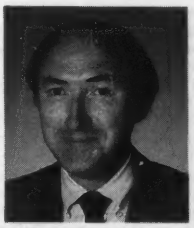

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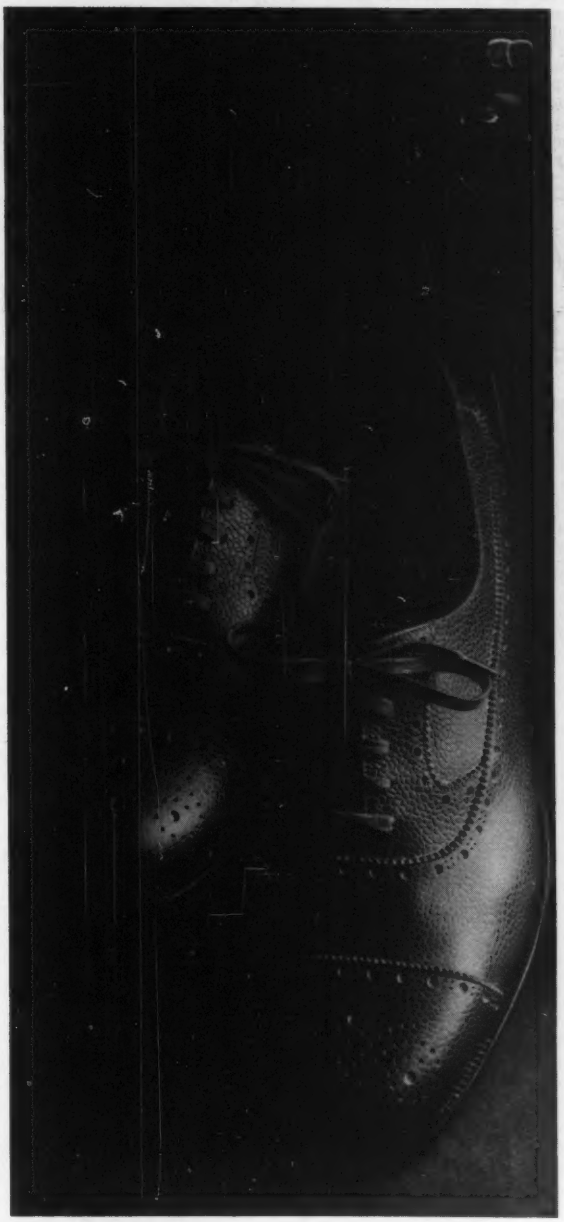

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Guessing IBM's game stirs fear

From page 1

er Corp. and Zenith Data Systems Corp., among others.

Once IBM introduces its 80386-based machine, existing vendors of 80386-based personal computers will "be blown out of the water," said George F. Colony, president of Forrester Research, Inc., a Cambridge, Mass., consulting firm. "When IBM makes its announcement, there's going to be a mad scramble by other 386 vendors to rework their machines to make them compatible. Those machines out now are going to become quick relics."

Although IBM has not commented specifically on an 80386 project, Lowe said in his keynote: "New graphics capabilities in hardware will require new designs and higher performance devices as well as new software support. Advanced communication support is required to improve the way PCs are tied together and linked to intermediate and large processors."

In fact, ESD is investing more than half of its research and development dollars into its own software, which "emphasizes connectivity, ease of use, multitasking, enhanced graphics and the support of complete IBM systems for all our customers," Lowe said. "This will integrate the PC effectively into our large account offerings with intermediate, large processors and communication systems."

Many users are holding back their moves to 80386 technology until IBM's direction becomes clear. More than 100 volume buyers informally surveyed in a seminar at Comdex/Fall '86 indicated by a show of hands that they are not going to spend their budgets on more Intel 8088- or 8086-based hardware. However, they also are not going to invest in the newly available 80386-based systems. Many said they would stick with the 80286-based systems that are still waiting for a Microsoft Corp. MS-DOS operating system that unleashes that processor's full capability.

"No way am I going to buy a 386. I'd bundle Intel boards with 286 systems before that," said Stephen Hysick, applications engineer for Acco Babcock, Inc. in Warren, Mich. Several cards offering 386 processors, including one from Intel, have been recently announced.

According to one independent source with ties to IBM's ESD, IBM's 80386 architecture will differ in several ways from current PCs', including the design of its read-only memory chips. As a result, the source said, those who buy a non-IBM 80386-based micro will have acquired, in essence, "a very expensive and very fast" 80286 machine. IBM's entry is scheduled to debut in third-quarter 1987, the source added.

IBM is also expected to unveil its machine only after the next Microsoft MS-DOS and IBM PC-DOS operating systems have been released, the source said, which should occur no sooner than the second quarter of 1987; many sources predict the systems' shipment next fall.

Forrester's Colony said he expects IBM's machine to differ from competitors' in three areas: the 32-bit data bus, a special Network Basic I/O Subsystem (Netbios) microcode and a customized Intel Corp. 80386 chip. Those three areas will make IBM's machine difficult, although not impossible, to clone.

As a result, competitive 80386 vendors will struggle to rework the architectures of their microcomputers to become IBM compatible. Normally, IBM clones appear about three months after the original, Colony said, but in this case it would be at least nine months before another vendor could truly claim to offer an IBM 80386 look-alike.

> ***'When IBM makes its announcement, there's going to be a mad scramble by other 386 vendors to rework their machines to make them compatible.'***
>
> — George F. Colony
> Forrester Research, Inc.

But not all customers are waiting for IBM. "I'm not concerned, personally, with what IBM will do, but I am concerned about what my corporation says, and they've been worried. They might not want all these Compaqs around," said Mikel G. Petersen, microcomputer support analyst of the End User Computing Unit at Sunbank Service Corp. in Orlando, Fla.

Petersen recently purchased two Compaq 386s to operate as network servers for a collections department data communications project that includes IBM's Token-Ring and Corvus Systems, Inc.'s Omninet. Because the machines have performed well as network servers, Petersen is planning to buy at least two more by year's end.

Because upgrading an 80286-based machine with an 80386 card does not offer the advantages of an 80386-based micro's 32-bit bus, Petersen said he will recommend the 80386 for future bank stand-alone applications as well.

"The longer IBM waits, the less different they'll be able to be," Petersen said, noting competitive pressure and the sheer number of 80386 products expected by the time of Big Blue's debut.

Computerworld *West Coast Correspondent Peggy Watt contributed to this story.*

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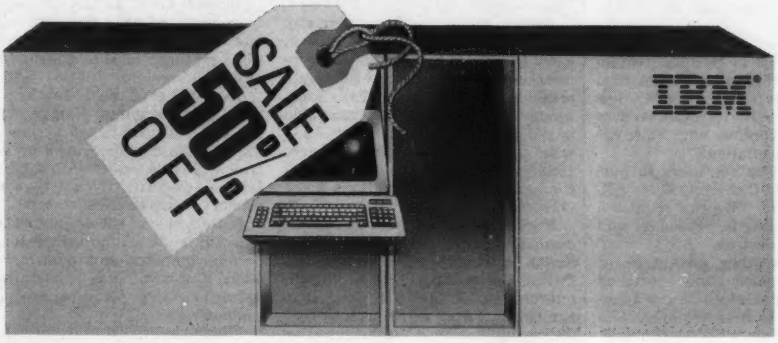

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LA New Orleans ... Sep 25, Dec 9
MA Boston ..... Sep 16, Oct 15, Nov 12, Dec 10
Burlington ..... Aug 12
Springfield ..... Sep 18
MD Bethesda ..... Jul 23, Aug 7, Sep 4, Oct 1, Oct 16, Oct 29, Nov 13, Dec 10
MI Detroit ..... Aug 19, Sep 16, Oct 14, Nov 18
Grand Rapids ..... Oct 16
MN Minneapolis .... Jul 22, Sep 9, Nov 4, Dec 18
MO Kansas City ..... Nov 12
St. Louis .. Jul 30, Sep 25, Nov 19
MS Jackson ..... Sep 11
NC Charlotte ..... Nov 6
Raleigh ..... Oct 8
NE Omaha ..... Sep 24
NJ Cherry Hill ..... Nov 20
Convent Station .. Aug 7, Aug 28
Iselin .... Jul 22, Sep 16, Oct 9, Oct 30, Nov 13, Nov 20
Princeton ..... Sep 25
NM Albuquerque .. Sep 16, Dec 10
NY Albany .. Jul 23, Sep 11, Nov 20
New York City ... Jul 24, Aug 12, Aug 26, Sep 3, Sep 17, Oct 2, Oct 22, Nov 6, Nov 25, Dec 9
Rochester ..... Aug 13, Sep 9, Oct 15, Nov 18, Dec 10
Syracuse ..... Aug 19, Oct 21, Dec 16
OH Akron ..... Jul 23
Cincinatti ..... Aug 5, Oct 21
Cleveland ..... Jul 22, Sep 23, Oct 28, Nov 13
Columbus ..... Aug 12, Sep 24, Oct 29, Nov 12
Dayton ..... Sep 9, Nov 5
OK Oklahoma City .. Sep 3, Dec 3
Tulsa ..... Aug 26, Nov 19
OR Portland .. Jul 24, Sep 23, Nov 6
PA Allentown ..... Sep 11
Harrisburg ..... Nov 6
King of Prussia ..... Jul 24
Philadelphia ..... Oct 9
Pittsburgh ..... Aug 7, Oct 16, Dec 9
Scranton ..... Aug 5
SC Charleston ..... Oct 7
TN Memphis ..... Sep 18
TX Amarillo ..... Oct 9
Austin ..... Sep 18, Nov 6
Dallas ..... Jul 22, Sep 9, Oct 14, Nov 18, Dec 11
El Paso ..... Dec 18
Ft. Worth ..... Sep 23, Nov 13
Houston ..... Aug 19, Sep 11, Oct 16, Nov 20, Dec 4
Lubbock ..... Oct 2
San Antonio ... Aug 27, Nov 5
UT Salt Lake City .. Aug 6, Sep 16, Oct 7, Dec 4
VT Burlington ..... Aug 6
VA Richmond ..... Sep 10
WA Seattle ..... Oct 23, Dec 11
WI Milwaukee ..... Sep 9, Nov 13

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Calgary ..... Sep 25
Halifax ..... Oct 15
Montreal ..... Aug 20, Sep 17, Oct 15, Nov 24, Dec 17
Ottawa .. Aug 7, Sep 11, Oct 9, Nov 13
Quebec City ..... Sep 10, Nov 12
Toronto ..... Aug 12, Sep 9, Oct 7, Nov 4, Dec 2
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FCC checks Comdex products

By Douglas Barney

LAS VEGAS — In a continuing effort to halt the sale and use of uncertified computer products, six agents of the Federal Communications Commission scoured Comdex/Fall '86 last week in search of illegal equipment.

The FCC's long-standing crackdown on uncertified equipment was boldly illustrated last spring when agents staged a surprise Comdex raid and issued some 2,500 tags to be placed on uncertified equipment. The agency then stated that it would attend subsequent Comdex shows to prevent the sale of illegal computer products.

The FCC regulates computer products to ensure that excess radio waves do not interfere with television reception and navigational transmissions as well as with police and ambulance communications.

"It is a general type of pollution," said J. Jerry Freeman, coordinator of the FCC's Computer Marketing Enforcement Program in Virginia Beach, Va.

Although final results were not available at press time, compliance with FCC regulations has risen due to the spring Comdex raid and a public awareness campaign that included an FCC-staffed booth at Comdex.

Earlier this year the FCC discovered that 94% of IBM clones from 87 vendors were not properly certified. Currently, some 70% to 80% of IBM clones fail FCC tests, officials said. Many of the problems result from inadequate shielding that leads to excess radio emissions.

"Without a doubt the biggest problem is with PC clones," Freeman said. Machines that fail the test are sent back for redesign and recertification. In addition, letters of warning, fines and equipment seizures can result from the attempted sale of uncertified equipment.

According to Michael Dell, chief executive officer at PC's Limited, an Austin, Texas-based mail order firm and clone manufacturer, the FCC has recently improved its effectiveness by providing vendors with more details on FCC regulations.

It is important for users to purchase only certified equipment, FCC officials argued. "We can require a user to stop using it," Freeman said of uncertified devices.

There is another advantage of properly shielded and certified equipment. "A shielded unit is a better unit because it is less subject to outside interference," Freeman said. Outside interference can cause a computer to act erratically and even reboot during use.

The FCC maintains an on-line data base of certified and uncertified equipment called the Public Access Link that customers and vendors are free to call. The system provides up-to-date information on certification or pending certification and is available free of charge.

Kodak unveils optical disk subsystem, erasable demo

By James Connolly

LAS VEGAS — Eastman Kodak Co. last week tied its introduction of a 6.8G-byte, 14-in. optical disk subsystem prototype with an agreement that may lead to standardization of 14-in. optical media.

Kodak, which said it will formally announce the optical disk system in early 1987, also held a preannouncement demonstration of a 50M-byte erasable 3½-in. optical disk. Each product is scheduled to be available in evaluation quantities in early 1987 with volume shipments in early 1988, according to Kodak officials conducting the demonstrations at the Comdex/Fall '86 show.

Kodak also announced the standardization agreement, under which Kodak will work with Philips and DuPont Optical Co. (PDO) to produce interchangeable disks. Under that agreement, PDO will act as a second source for the 14-in. media used in Kodak's subsystem. The pact does not bar PDO from developing its own subsystem.

Peter Giles, Kodak vice-president and general manager for mass memory, said Kodak and PDO will cooperate in establishing standards by groups such as the American National Standards Institute. He said the cooperation by the two major players in the 14-in. market should lead to an industry standard that could be as effective as the compact disk/read-only memory standards that apply to smaller optical storage systems.

Kodak officials said the rack-mountable, 14-in. disk drive is suited not only for archival storage but for use with managing images and large data bases in a random-access storage manner.

John C. Batterton, general manager of marketing for Kodak's mass memory division, said the write-once disks store 3.4G bytes on each side, using five tracks per side to ease storage management. "Optical storage will fit into lots of places where tape and magnetic storage are now being used, but the bulk of the applications will be new," he said.

He added that the large storage requirements of electronic publishing and other image-oriented applications are target markets for the 14-in. optical subsystem.

He noted that the 14-in. disk will not replace magnetic storage, which he said features faster access and higher data transfer rates, or tape, which provides users with a greater sense of security than does a new product such as optical storage.

Batterton said the 14-in. disk system will be most appropriate for superminicomputer environments but added that it will also be useful with networks of high-performance microcomputers.

Kodak said the subsystem will offer small computer systems interface and IPI-3 connections and feature a 1M byte/sec. transfer rate and an average latency of 27 msec.

No price was announced for either the 14-in. subsystem or the erasable disk drive.

That erasable drive, developed by Kodak's Verbatim subsidiary, will be available initially in single-sided versions. Company officials said, however, that a two-sided version with 50M bytes of capacity on each side should follow. The cartridge for the half-height, 3½-in. drive is slightly thicker than a magnetic disk cartridge.

Erasable media uses thermomagneto-optic recording technology, in which a head writes on the disk by focusing a laser beam on a magnetic film while applying a magnetic field. The light heats the film under the focused spot and magnetizes that region of the disk.

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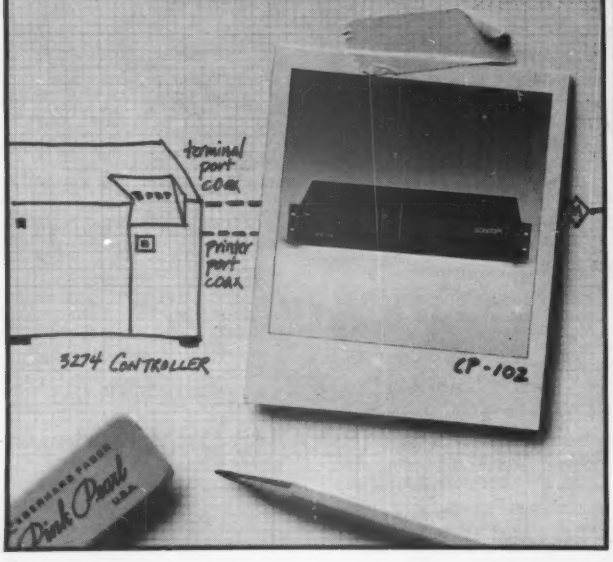

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Vendors rush 386 systems to Comdex with '87 availability

By David Bright

LAS VEGAS — Despite the heralded introduction at last week's Comdex/Fall '86 show of systems and add-in boards based on the Intel Corp. 80386 microprocessor, the majority of the products will not be available until March or April 1987.

In the face of uncertain demand for 80386-based products, many of the vendors were apparently using the show to assure customers that they are capable of offering performance in the class of Compaq Computer Corp.'s Deskpro 386 system.

Some of the products were prototypes, indicating that vendors had to rush to offer products at Comdex. One marketing manager claimed that Compaq's machine, which debuted in September, triggered the rash of 80386-related introductions. "If it weren't for Compaq, this would not be a 386 Comdex," noted Frank Valcarcel, manager of Kaypro Corp.'s Network Products Group.

Valcarcel speculated that the sudden 80386-related activity could cause Microsoft Corp. to speed development of an MS-DOS operating system that would take advantage of the 32-bit chip's extensive power. The common complaint from managers was that appropriate software has yet to be developed for the 80286, let alone for the 80386.

Kaypro introduced a family of 80386-based machines ranging from $4,995 to $19,950. Other vendors showcasing systems included Zenith Data Systems Corp., Convergent Technologies, Inc., PCs Limited, Wyse Technology, Inc., Multitech Corp. and MAD Intelligent Systems, Inc.

Convergent plans to begin OEM deliveries in December, and Computer Dynamics of Austin, Texas, claims it will ship its Micro System 386 by the end of this month, but the rest of the above vendors are planning 1987 availability. Among vendors showing 80386-based boards for 1987 availability were Intel, Quadram Corp., Definicon Systems and Applied Reasoning Corp. Vendors might actually benefit by holding product shipments until spring or mid-1987 when IBM is expected to bring out an 80386-based system to ensure IBM compatibility, some observers noted. But since most of the 80386 machines maintain IBM Personal Computer AT-compatibility, the vendors point out that their systems will still be useful no matter what IBM's next move may be.

Vendors, resellers and information managers alike expressed curiosity about the new class of products. The most frequently mentioned uses for 80386-based systems were as file servers or in engineering applications. But despite their curiosity, managers were hard pressed to find a need for the products in office automation environments.

Andy Seybold, head of Seybold Consulting Group, a market research company based in Torrance, Calif., said he was "sorry to see the 386 thrust upon the industry this quickly without the 286 being fully utilized." But with a wealth of 80386-based systems soon to become available, "I guess somebody's going to buy them," Seybold said.

At the PCs Limited booth, a very compact 80386-based system was displaying a fast-changing array of color graphics patterns. Though intrigued, Jorgen Lindvig, systems director at International Service System, Inc., a building maintenance company in New York, said he had no plans to invest in the technology yet. "I don't think we need all that extra power," he said. PCs Limited said systems without a hard disk drive would start in the mid-$4,000 range and be available in the first quarter.

Multiuser systems also debut

Several firms unveil 300 dot/in. printers

By James Connolly

LAS VEGAS — Multiuser systems based on Intel Corp.'s 80386 microprocessor and printers featuring 300 dot/in. resolution were among the products offered for small systems at Comdex/Fall '86 last week.

Rexon, Inc.'s Rexon Business Systems division announced its TX Series of multiuser business systems, which runs Microsoft Corp. MS-DOS, Unix and Pick Systems' Pick as operating systems.

That series includes a two- to 16-user supermicro based on Intel's 80286 chip and the high-end console model RX405-TX, built around the 80386.

Supports 32 users

Rexon officials said the high-end model supports up to 32 users, 4M bytes of memory and up to 227M bytes of storage.

Rexon Executive Vice-President Robert Love said the TX Series was designed to run Santa Cruz Operation, Inc.'s Microsoft Xenix System V, software written for the IBM Personal Computer AT and Pick software. Rexon said most models of the TX Series are available now from $13,270 for the entry-level RX105-TX to $26,490 for the RX405-TX.

Another company introducing an 80386-based system, SCI Technology Inc., said its CPU will support a physical maximum of 64 users or about 16 users in a typical DP or office automation job mix.

OEM market targeted

SCI, which is targeting its SCI 3000 at the OEM market, has not set a price for the system, which company officials said is now in alpha test and will be available in early 1987. The system reportedly will run AT&T Unix System V.3.

Companies announcing 300 dot/in. resolution for laser printers included Kentek Information Systems, Inc., which reportedly enhanced the controllers and LED array imaging heads on its K-2 printer.

That 12 page/min printer reportedly is the engine used in IBM's 3812 laser printer.

OEM price

The enhanced version is the K-2/300, which has an OEM price of about $8,000.

Ricoh Corp. also announced 300 dot/in. resolution for its 6 page/min PC Laser 6000 printer. That printer has a suggested list price of $2,395.

Ricoh also displayed 300 dot/in. printers with speeds of 16 page/min and 40 page/min. However, the company declined to provide prices and availability dates for those models, known as the LP4150 and LP4400.

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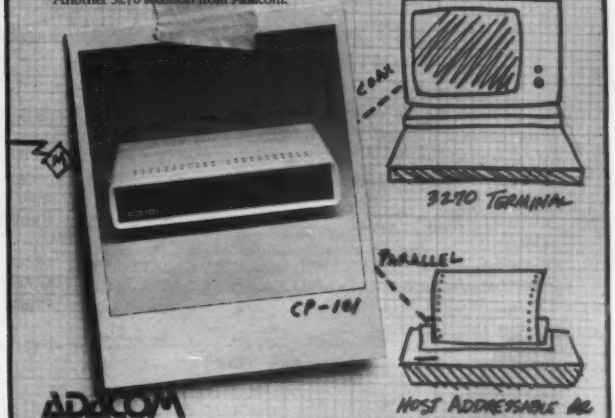

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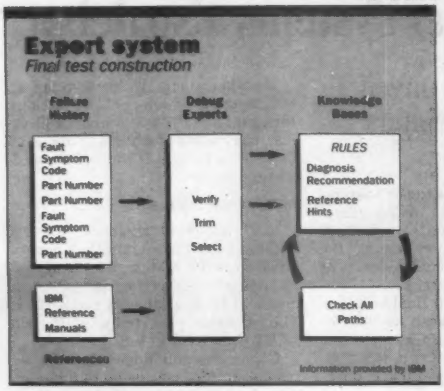

In the construction of DEFT, the two debug experts reviewed six months of failure history and refined the raw test data into a set of rules. Drawing upon their combined expertise, they created 198 knowledge bases containing diagnoses, repair recommendations, repair manual references and helpful hints derived from their years of hands-on experience.

Vendor uses expert system to assemble, test DASD units

By Eddy Goldberg

SAN JOSE, Calif. — Using an application developed with its own Expert Systems Environment (ESE), IBM is saving an estimated $5 million to $8 million annually in three disk drive assembly plants worldwide. The yearly savings from a second expert system application, to be added this month, are expected to be even greater.

The industry giant is using its own 370-based expert systems development product, running under its VM operating system, for final assembly and testing at its 3380 direct-access storage device (DASD) disk drive plants located in San Jose, Berlin, West Germany, and Fujisawa, Japan.

At the San Jose plant, 3380 components, already tested individually, are assembled and tested together for the first time in the unit test operation. In the final test operation, the 3380s are given a 15-hour stress test in which IBM internal engineers perform simulations of how customers will use the DASD products.

The project to develop the application, Diagnostic Expert — Final Test (DEFT), began in October 1985. DEFT was installed on March 31 of this year, and a six-month evaluation of the system shows an estimated annual savings of 40 worker-years, a 50% reduction in parts waste and an improvement in diagnostic time by a factor of five to 20.

The project differed from many approaches to expert systems development, in which knowledge engineers extract and encode the expert's domain knowledge, according to Don Palese, advisory programmer on the DEFT project. Instead, the experts, two senior test technicians, were trained to become knowledge engineers and develop the application themselves.

With a one-week class of basic training in ESE, the two technicians began to work on encoding their knowledge in an expert system. During the next four to five months, armed with a six-month history of test results and support from the DEFT project team, the two technicians wrote 99% of the code themselves, using IBM 3270 terminals connected to an IBM 3083. Neither technician had any previous programming experience.

Direct involvement of the domain expert in developing the application was considered an essential ingredient to the project's success, says Steve Snyder, senior marketing support representative with IBM's Information Systems Group in Palo Alto, Calif., who has been involved with the product since its inception as an internal project seven years ago. The result is that DEFT was written by technicians for technicians and uses their own terminology. No translation in and out of specialized programming commands is necessary.

The technicians in San Jose say the on-line Help, which is available from any screen, is their favorite of all DEFT's features, according to Steve Viallet, senior unit test technician. Viallet and computer systems technician Craig Diltz wrote the expert system. Their expertise is now on-line 24 hours a day, seven days a week, complete with Help and full explanations of why a particular diagnostic analysis is made.

This feature cuts diagnostic time and is particularly useful as a learning and productivity tool, Viallet says. "New technicians don't take up as much of our time now." DEFT also is an excellent tool for training new technicians, as well as for improving the skills of nonexpert test technicians, Viallet adds.

Selection of the proper project for a first run as a production-level expert system was a critical project decision, according to DEFT project

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Processing Speed	8MHz	4.77MHz	4MHz	6 or 8MHz	4 or 8MHz	4.77MHz
Built-in Printer	Yes	No	No	No	No	No
Internal Hard Disk Drive	Yes	No	Optional	No	Yes	No
Both 5.25" and 3.5" Media Support	Yes	No (3.5" only)	Yes	Yes	Yes	Yes
Internal Modem 1200/2400	Yes/Yes	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Wang Systems Networking V3 Connectivity	Yes	No	No	No	No	No
SCSI Port	Yes	No	No	No	No	No
Battery Operated	Yes	Yes	Yes	Yes	No	Yes

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leader Quinton O'Neal. About a half-dozen different applications were considered.

Although it was clear that the final test project, if successful, would boost the productivity of all the technicians in the plant — freeing up the senior staff and allowing junior technicians to perform more complex test repairs — the key factor was the strong probability of a payback.

"We sold the product to management on the basis of productivity," O'Neal says. He also conducted half-day educational sessions with management on what expert systems were about.

The final test operation was especially well suited to expert systems technology, he says. Final test is controlled by one area, the easy defects have already been caught in individual component testing and the problem to be solved was boundable and small enough to be attacked, Palese says.

IBM support a factor

The fact that ESE was a finished product with support from IBM was a factor in its favor, Palese adds. Since it runs under VM, any application written in ESE would fit right in with the San Jose plant, already a large VM user.

"To VM, ESE looks like any other application. You can slide it right in," according to Palese. ESE, written in Pascal, also has the ability to run under IBM's MVS.

The system was put into production in March. Over the next three to four weeks, new defects and the diagnoses to fix them were added to the system. After Viallet or Diltz pored through stacks of documentation to solve a new type of problem, their expertise was encoded into DEFT.

Groundwork

The groundwork was only done once and is forever accessible to the rest of the technicians. The expertise of Viallet and Diltz was finally encoded into 1,426 "if-then" rules in a total of 198 knowledge bases. These knowledge bases can be updated at any time.

During the six-month evaluation period, which ran from March to September, 658 product bugs were recorded in the final test operation. Of those, 305 diagnostic attempts were made using the DEFT system, with 286 accurate diagnoses made on the first try using DEFT — a 94% success rate.

DEFT is used in the more complicated cases, so the remaining 353 diagnoses did not require its use.

Greater complexity

IBM is working on an expert system in San Jose for the unit test operation. "The complexity of the problems in the unit test area is much greater than in the final test," O'Neal says.

The application is currently running in limited production mode in the San Jose facility, with plans to send it to Berlin and Fujisawa this month. It took seven months to complete and is expected to result in even greater savings than with DEFT.

Still, though the millions of dollars and the 40 worker-years saved have clearly been worth the development effort, DEFT, like all expert systems, is not a miracle cure. "It's just a tool. It didn't change our lives too drastically," Viallet says.

IBM mainframes gain channel extender

Will give users data center backup ability

By Stanley Gibson

SHELTON, Conn. — Data Switch Corp. is scheduled to unveil tomorrow a channel extender that the firm claims enables IBM and compatible mainframes to communicate with high-speed devices over 45M bit/sec. DS3 circuits.

By connecting the mainframe computer channel directly to the telephone circuit, the Model 9055 will allow users to perform data center backup tasks with 3M byte/sec. data streaming devices at a remote location, according to the vendor.

The product is said to be particularly useful for setting up an on-line disaster recovery system: If the main computing site goes down, the data can be secured at a remote site.

Connects remote terminals

The Model 9055 can also be used to connect remote terminals, such as graphics workstations, and to communicate with remote printing pools, according to a Data Switch spokesman.

By connecting existing remote equipment, the new product can save companies from purchasing redundant equipment for a central data site, the spokesman pointed out.

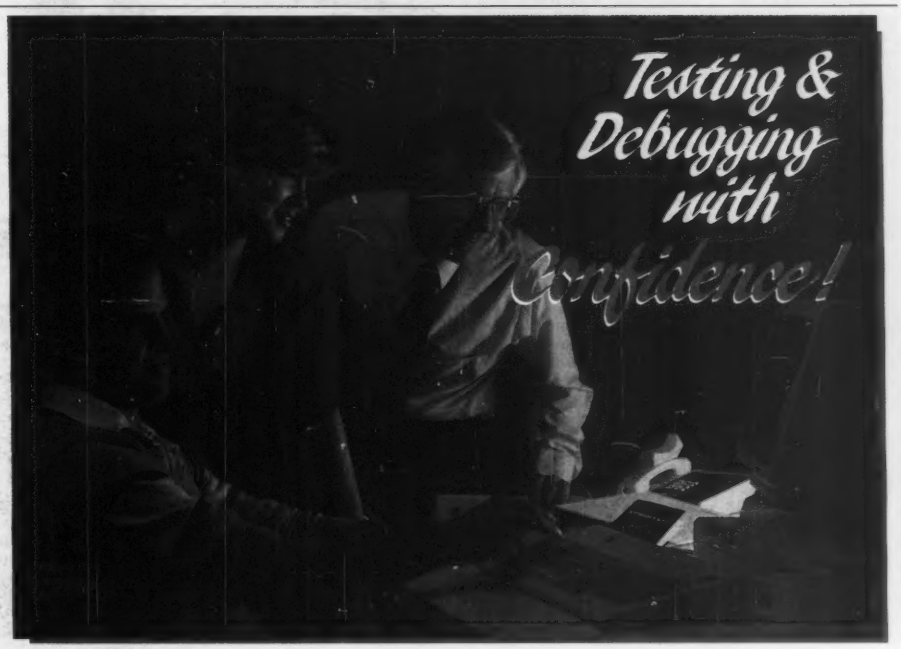
In addition, he said, the system can save the cost of locating front-end processors at each site, which typically can cost around $250,000 each.

Includes controller

The Model 9055 costs approximately $180,000 per link, including two extender units, one on each end; the systems controller, which can control up to 16 links; and the cabinetry.

Links can be added to the system by adding extender units, at $80,000 to $90,000 per pair.

Volume shipments of the product are scheduled to begin in February, according to Data Switch.



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VIEWPOINT

EDITORIAL

Curtailing cutbacks

"Indiscriminate, that's what this latest round of cutbacks is. Nobody looks at what we contribute, they just tell us MIS is no different from any other department and we all have to cut staff by 10%."

The frustration of this MIS manager is echoed by his counterparts across the country, in organizations of all sizes and shapes, as corporate America continues the painful task of reducing its costly white-collar work force in an attempt to survive a sluggish domestic economy and an increasingly competitive international marketplace. Headlines and news reports have chronicled the layoffs of an estimated 500,000 in the last two years; now they forecast the loss of thousands more within the likes of AT&T and IBM, companies with long traditions of providing secure, lifetime employment.

For MIS, this process is particularly painful. Until the last year or two, data processing staff seldom found themselves on layoff lists. The most critical problem facing MIS managers was finding and attracting people from a too-small pool of candidates. When individual companies did tighten their belts, cuts meant losing a programmer or two.

No longer is MIS immune, and no longer are cutbacks occurring only at the lower rungs of the data processing ladder. In fact, more often than not it is the more highly paid MIS personnel — particularly those in middle management positions — who are the likeliest layoff targets. And while earlier recessions may have resulted in temporary layoffs, the latest paring appears to be permanent.

To thrive amid these pressures for reduced staffs and lowered budgets, MIS managers must surmount their largest continuing challenge: Seizing a leadership role within their corporations by showing — in quantifiable terms — how data processing can help achieve corporate goals and objectives.

Those at the leading edge of the profession are already wrestling with just that challenge, according to research reported recently by University of Colorado professors J. Daniel Couger and Robert A. Zawacki. In a complex research regimen requiring repeated questionnaire responses, 50 chief information officers at major American corporations were asked to agree on the human resource issues most critical to MIS success during the next decade.

Their number one concern: Acquiring a stronger business orientation in order to reorient their departments from an emphasis on technology to one on the company and its customers. Close behind on the list came the need to select, train and reward managers who are good business managers first and good technicians second.

The message is clear. In this time of economic stress, the task for MIS managers is to see that MIS is clearly recognized for what it is — a resource, not an overhead item — and that it is managed as such — for optimum benefit, not for minimum cost.

LETTERS TO THE EDITOR

Before VTAM, there was VDAM

Merv Adrian's article, "VTAM links micros, hosts" [CW, Oct. 13], gives the false impression that two products — one released to beta test this July and one not yet released — are the first of their kind. In fact, VDAM, developed by Phaser Systems, Inc. four years ago and currently marketed by OBS Software Co., a division of On-Line Business Systems, Inc., is a VTAM link released in August 1983, with more than 2,000 users on an impressive list of Fortune 100 companies. The author ignored a product in use by major companies and government installations, such as General Motors Corp. and the U.S. Postal Service.

VDAM offers every feature listed in the article and more. With regard to transfer speed, VDAM still is the fastest product on the market, with three years of field operation to prove it.

Jack Rodgers
Director of Marketing
OBS Software Co.

The most important thing about SQL

With regard to Stephen Gerrard's article on Structured Query Language [CW, Sept. 22], I believe the important thing about SQL is that programs may now use a single language to communicate with data managers. SQL provides a data-structure-independent means for programs to specify the data they need and the way the data is manipulated. No longer do programs need to be changed when the underlying structure of the data changes.

Gerrard brings into his article all of the other programs that use this interface, such as query languages, report generators, application generators and data base management systems, and seems to base his argument on the shortcomings of these products. SQL is not generally usable as an end-user language. It is too complex and mathematically oriented. Many languages that are easier to use directly by end users to manipulate data exist and the language interpreters should be rewritten to use SQL as their interface to the data on behalf of the requestor.

SQL has the qualities Gerrard describes in the first part of his article. The standard is but a start toward a universal data language.

The language should not be confused with the data base management system that implements the relational data model and the products that should use SQL to manipulate data stored in the data base management system. Those are other problems altogether.

Alan R. Hirsch
Senior Consultant, Strategic and Tactical Planning
Amoco Corp.
Chicago

Copyright vs. trade secret protection

I am compelled to write concerning L. J. Kutten's article, "Untangling software program copyright laws" [CW, Oct. 20], in which he alleges it is "ill-advised" to place a copyright notice on software products that are also protected by trade secret law. He bases this on the allegation that publication of a work destroys trade secret protection. I believe this assertion is contradicted by legal precedent and scholarly authority.

Although there admittedly was some uncertainty in this area when the cases cited by Kutten were decided (1978 and 1980), more recent cases indicate a clear consensus that copyright and trade secret protection are entirely compatible forms of protection and generally do not lessen the protection available by either.

Moreover, if software developers relying on trade secret protection fail to place copyright notices on their software, as Kutten advised, copyright protection would likely be lost forever. The Copyright Act provides specific remedies for copyright infringement, including statutory damages, attorneys' fees and impoundment of infringing copies. Trade secret law does not provide the same types of protection as copyright law.

Copyright law is a very powerful tool for protecting software and, for the most part, does not conflict with trade secret protection.

Paul B. Overhauser
Baker & Daniels
Indianapolis, Ind.

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VIEWPOINT

When the computer becomes a disposable commodity

Name your favorite high-tech disposable commodity. Cassette tapes, for instance. Phones from Taiwan. Floppy disks. Those miniature calculators you get as gifts from rental car agencies.

Wait a second. You neglected to mention computers and computer terminals, because, yes, these are quickly becoming disposable commodities. Disposable — as in, you might as well throw them away rather than spend money to get them fixed.

Hundreds of products developed in the past few years fall into this category. Let's begin with technology in general and move on to computer specifics.

Repair estimates

A friend of mine mentioned that her $49 Walkman unit had ceased to operate and she intended to get it fixed. I suggested she just throw it away because the world could do with fewer Walkman-wearing humans. Instead, she took it to an authorized repair shop in town and received a repair estimate. Combined cost of labor and one part for a $49 machine: $42. She threw the Walkman away. Unfortunately, she bought another one.

A purchasing agent at a company in which I once worked had two of his original 1982 IBM Personal Computers go on the fritz in rather nasty ways. Each of these machines had cost him about $3,000 in 1982, when they were outfitted with 128K random-access memory and two disk drives. The damage to the machines was at the motherboard and power supply levels, and each repair was going to cost him $700 to $900. After debating for two weeks about justifying the cost of repairs, he pulled the disk drives and tossed both chassis into the garbage. With the money he saved he went to a local computer discount warehouse and bought three new generic computers, each loaded with 512K memory.

By HARVEY P. NEWQUIST

In 1983, IBM's famed 3270 Personal Computer terminals were being cloned left and right by companies such as Memorex Corp., IIT Research Institute and Courier Corp. Smaller machines and smaller prices moved some of these companies right into the computer terminal mainstream against IBM. With costs around $1,995, these terminal clones were big sellers at large user sites. Once they had so many terminals, companies wanted extensive service and support as well. For a few hundred dollars a year, they could get on-site support from the vendor or any of the large third-party service companies such as Western Union Corp.

How times have changed. Clones now sell for around $495 and come from hundreds of independent manufacturers around the world. And what about that much needed customer support that brought in about $300 more revenue with each unit sold? Forget it. Why pay to have a terminal fixed when, for a few dollars more, the MIS manager can jump into his car, go to Terminals R Us and get a brand new one?

On the software side, the notion of purchasing $99 software from the likes of Borland International and Paperback Software International, Inc. is usually greeted with the line, "Hey, it's only 99 bucks! What the hell, if you don't like it, you can always throw it away!"

Besides adding to the bulk of garbage that corporate America produces, commodity-oriented products in the computer industry will have some major effects, not all of them positive. A disposable commodity results in the sale of more new products but cuts into the service and maintenance sector. Remember how on virtually every street corner there used to be great repair shops that could fix anything and everything? Those shops have virtually disappeared since items now get returned to the manufacturer or the dealer or are even obsolete by the time the limited warranty runs out. My friend's Walkman is a case in point.

Machines to service

An entire subindustry currently exists devoted to maintaining computer equipment. There will always be machines to service, mostly because I can't imagine anyone throwing away IBM 3090s anytime soon. The little things, though, are the things that have always accounted for volume in this industry, not the isolated big job on somebody's Cray Research, Inc. XMP. Service calls at 9:30 p.m. on the controller's terminal, board-swapping on a personal computer during company inventory-taking or screeching disk drives in De Kalb, Ill., have been the kind of unforeseen events that prompt companies to invest in maintenance service for their machines. With throw-away products, service becomes an unnecessary expense.

We probably should have seen it coming. When a society starts selling millions of disposable items from diapers to automobiles — no one is going to convince me that the Hyundai and Yugo aren't designed to be disposable — then disposable hardware and software applications are inevitable.

And wait until I tell you the story about the disposable laser card that stores information outside of the realm of gigabytes and MFLOPS.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

Automating the entry-level job market: Where's the work?

Traditionally, manual labor and entry-level jobs (washing dishes, making change) have been held by those at the margins of society, such as youths entering the work force, those with weak skills or spotty work records or recent immigrants with poor language skills.

The increasing functionality of robotics and computers, combined with their greater affordability, may easily destroy some of those jobs, particularly in the service sector.

This situation offers many opportunities for both data processing professionals and computer industry entrepreneurs, but it also raises some disturbing issues.

The telephone operator

Lower-level jobs have always been under siege and the automation of them has often had beneficial effects on society. The telephone operator business is a classic example. If calls were still handled manually instead of by automated equipment, an extraordinary number of operators would be required to handle today's call volume and the job might get done less efficiently now.

A good recent example of repetitious jobs not requiring excessive education or experience is the fast-food business. From a purely technological standpoint, the burger kings of the world could replace many of the employees behind the cash registers with inexpensive point-of-sale keyboards so customers could enter their own orders — in effect, a fast-food version of customer dialing.

I suspect these employers must have some mixed feelings about the prospect of replacing employees with keyboards. On one hand, they could lower costs and eliminate some headaches caused by employees who don't show up or who are surly to customers. Since labor costs today amount to a large part of the cost of unidentified frying objects, employers must be giving some serious thought to this possibility.

By HOWARD A. KARTEN

Harley Shaiken, an economist by background and currently professor of communications at the University of California at San Diego, is one of the leading U.S. authorities on issues in information technology and the workplace. He thinks fast-food establishments are sure to automate cooking and food preparation. "The only question is the economics of the situation and how fast it spreads," he observes. Shaiken thinks this could occur sometime within the next three to five years "on an experimental basis."

However, Shaiken points out, "there may be a social obstacle to replacing the order takers, in that the order taker exercises a certain control over the operation." A minor example is the way McDonald's trains its employees to reply "Is that with cheese?" when you order a hamburger, or ask what you'd like to drink if you don't order a beverage.

A spokeswoman for McDonald's Corp. says the company had briefly looked at possibilities for automation but rejected them on the ground that people contact is so important to their business. However, she also indicated that McDonald's would most likely continue to review the situation in the light of economic and technological changes, as any savvy business operation would.

Why should we care about the loss of jobs such as those offered by McDonald's and its kin? According to Shaiken, "entry level jobs [such as these] have been an important area of job growth, even though they are low-paying, dead-end jobs, so the question is, What is the alternative?"

One answer is, even worse jobs. Or unemployment. And greater unemployment among youths — or unemployability — would probably lead to an increase in crime. Consider, too, that for many of the folks behind the cash registers, their brief training by the employer is the first formal training they've ever had in the proper way of interacting with customers. It may not be great, but some of them are able to parlay their training and experience into bigger and better jobs. Without it, they may well find it difficult to obtain any kind of work.

The growth of automation

More automation in these and other businesses is inevitable. The only question is when. The growth of automation will mean a wealth of opportunities for everyone in the computer business, data processing professionals as well as entrepreneurs.

Some obvious business possibilities will be in programming robotic equipment, writing software for point-of-sale terminals, creating models to determine how much food to prepare at any given time and so on.

One of the de facto laws of economics is that everything is connected to everything else. So as hands are rubbed in anticipatory glee at the business opportunities arising from greater automation, perhaps someone, somewhere, should be thinking about the social problems that may arise at the same time.

Karten has been involved with computers for two decades as a programmer, systems analyst and DP manager and is author of How to Profit from Dow Jones News/Retrieval.

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SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Sorting out 9335 rumors

Caution, not panic, appears to be the watchword for IBM System/38 users interested in moving up to IBM's 9335 disk drive.

As rumors fly regarding 9335 shipments being frozen and the disk drive failing to meet promised performance levels, at least a few signs appear to give users some sense of the truth. It seems that there may be problems with using the drive but that they have not proven to be fatal flaws.

The 9335, with a capacity of 855M bytes, was introduced as the replacement for the IBM 3370 in June, with promises of August shipments and claims of a faster access time — 18 msec — than the older drive.

Reports have circulated that IBM shipped a few drives, only to discover problems once they were attached to System/38s. Some reports go on to say that shipments were halted because of the problems. IBM has responded with repeated denials and clarifications that sometimes conflict with each other. The most recent IBM stance is that the original shipment date was met and that because of the unexpected customer demand for the 9335, each System/38 customer is entitled to only one 9335 shipment until early 1987.

As the uncertainty continues, a few things appear certain. If a customer orders a 9335 today, it may not be delivered for six months. If customers want more than one drive, they will have to settle for 3370s, which IBM

See **SORTING** page 20

Connolly is Computerworld's *senior editor, systems & peripherals.*

Sperry unveils tape unit with 3480-type cartridge

By Eddy Goldberg

BLUE BELL, Pa. — Sperry Corp. recently announced a magnetic tape unit and controller for its 1100 series mainframes that are based on IBM's 3480 tape subsystem and feature compact cartridges and a reduction in floor space requirements of more than 50%.

The Uniservo 40 and Model 5073 controller are manufactured by IBM, according to industry sources, as are the cartridges, so users should have no trouble with data interchange between Sperry and IBM systems.

"The cartridges are identical with the [IBM] 3480s," according to a Sperry official. He said Sperry is the first computer manufacturer after IBM to announce it will use the 4- by 5- by 1-in. cartridges in a subsystem. He expects the 3480 to become an industry standard. "It's a technology that's here to stay. Users do want it and now we're providing it," he added. The first customer shipments are scheduled to begin in March 1987.

Though the compact cartridges are about one-quarter the size of a standard 10½-in. reel, they hold 16% to 24% more data than a standard reel, according to the Sperry official. With 24K-byte data blocks, each cartridge can hold approximately 200M bytes, he said.

The cartridge subsystem occupies 27½ square feet of floor space, compared with 62.7 square feet for its 10½-in. predecessor, the Uniservo 36/5042, for a 57% space reduction.

The Uniservo 40 has a maximum of 16 drives per subsystem with two control units or eight drives with one control unit. The recording density is 37,871 bit/in. The Uniservo 40/5073 subsystem can be used with the Sperry 1100/60, 1100/70, 1100/80 and 1100/90 mainframes.

Key features include automatic buff-

See **SPERRY** page 20

Eight-CPU 3090 seen for late '87

Three-, six-processor Sierras predicted soon

By Jeffry Beeler

PALM SPRINGS, Calif. — A market research firm is predicting the announcement of IBM's eight-processor Sierra complex, the 3090 Model 800, by late 1987 or early 1988.

International Data Corp. (IDC), located in Framingham, Mass., also expects IBM to add both a three- and a six-way CPU system — the Models 300 and 600, respectively — to its 3090 series by the first quarter of next year.

But if IDC's forecasts, offered at an IDC executive conference held here recently, are correct, IBM's first-quarter extensions to its Sierra line of high-end mainframes will by no means be limited to the introduction of additional multiprocessor complexes.

During roughly the same time that the industry giant announces the Models 300 and 600, it will also add various enhancements to the 3090 line's existing models, according to Frank Gens, IDC's vice-president for IBM services.

Included among the enhancements he foresees for the current 3090 family members will be a 50% increase in channel speeds to 4.5M byte/sec. and a hardware performance improvement that will boost the machines' throughput by 5% to 10%. IBM will also enhance the mainframes with a capability that will allow users to store data base indices or other frequently used application data in expanded storage, Gens predicted during an address at the conference.

At the intermediate end of its processor

See **EIGHT** page 21

INSIDE

Dataproducts introduces a solid ink printer for use with micros/**20**

Computer Consoles fills gaps in its processor line with two office environment systems/**23**

NEW THIS WEEK

- Maxell introduces 5¼-in. write-once read many times optical disk
- Hitachi offers two Winchester disk drives

For more on these and other new products, see pp. 91-117.

INSTANT ANALYSIS

"They are trying to provide one-stop shopping for large organizations, absolutely."

— Dale Kutnick, Gartner Group executive vice-president of research, on IBM's enterprise marketing programs.

IBM tries enterprisewide marketing to cover corporations

'One-stop shopping' services seen goal

By Jean S. Bozman

It is only one word, but it conjures up a powerful image for IBM. In many large MIS shops, the word is "enterprise."

When IBM looks at a Fortune 1,000 customer or a federal agency, observers say, it sees multiple sites — factories, offices and engineering labs — each with different computing needs. As IBM's hardware sales lag, these observers say, it is important to look at how much revenue IBM could generate if each site made enhancements, bought new software or added a few applications. That is where enterprisewide marketing programs come into play, observers conclude.

One senior IBM manager recently explained what enterprise means to IBM. "An enterprise is an entire corporation, like a General Electric or a General Motors. An establishment, on the other hand, is any one site within that corporation."

Indeed, a recent IBM presentation to customers concluded that those with "Enterprisewide Planning" could achieve better business results than those without it. The presentation even referred to an "Enterprise Support Portfolio" offered by IBM — one that melds executives' business goals and strategic information systems guidelines into an enterprise model for MIS.

But analysts say that IBM does not always use the word "enterprise" outside the company — or even in customer presentations. "I don't think they like people applying labels to their marketing strategy," says Dale Kutnick, executive vice-president of research for the Gartner Group, Inc. in Stamford, Conn. For that reason, he says, not all enterprise programs come with the label "enterprise."

The intent, however, is the same. "They are trying to provide one-stop shopping for large organizations, absolutely," according to Kutnick. He says the trend toward enterprise-oriented marketing accelerated about two years ago when IBM decided to abandon the National Accounts Division-National Marketing Division two-tier sales approach, a decision implemented in January.

IBM maintains that the demise of a National Accounts focus in marketing means that IBM is a one-size-fits-all vendor. "Since our reorganization, our marketing has been geographically oriented, and the term 'enterprise' is kind of meaningless," says Les Szabo, an IBM spokesman.

In theory, at least, any IBM sales representative can sell any of IBM's hundreds of products, and IBM will sell all products to all customers. But, apparently, some customers are more interesting than others. For example, Electronic Data Systems Corp. (EDS) obtains terminals and personal computers at volume discounts of 30% or more, EDS insiders say. That is because EDS has such large hardware requirements that deep volume discounts are justified.

A similar large-scale approach was taken with the now-defunct Enterprise Maintenance Agreement (EMA), which was targeted at top accounts only, including EDS, Hughes Aircraft Co. and Fortune 500 compa-

See **MARKETING** page 21

Dataproducts adds solid ink printer, claims better-than-laser quality

By James Connolly

WOODLAND HILLS, Calif. — Introducing the first product in what the company promised will be a series of printers using the same technology, Dataproducts Corp. has announced a solid ink printer.

The Model SI 480 solid ink printer operates at 200 to 400 char./sec. and will typically support one to three microcomputer users in office automation tasks. According to Dataproducts President Jack C. Davis, the printer's most important feature is its print quality, which Davis claimed exceeds that of laser printers and IBM Selectric typewriters.

The printer incorporates a technology in which a pellet of ink is melted in the printhead. The ink is fired on a drop-on-demand basis through nozzles toward the paper, where the ink bonds with the paper and solidifies. Davis claimed print quality remains high regardless of paper texture, even if it is as coarse as sandpaper.

The solid ink technology was developed under a joint marketing agreement between Dataproducts and Exxon Corp.

Davis said that Dataproducts is working on other solid ink printers. Company officials said they are considering developing a color printer and higher performance printers. The SI 480 is scheduled to be available from dealers in the first quarter of 1987 for $2,795.

Analysts said that as a first product of a new technology it appears to provide the features and quality needed in the limited market Dataproducts is targeting.

Angele Boyd, research analyst with International Data Corp. in Framingham, Mass., noted the printer offers the appropriate emulation modes, font cards and paper capacities.

"We are very impressed, especially with the quality of the print. They insist that they are targeting what they call the prestige office market, the person who is willing to pay for that quality," Boyd responded when asked about the price. She noted that the product is not intended to be a mass-marketed desktop printer.

Another analyst, who said he was impressed by the print quality, observed that Dataproducts might have trouble moving the technology to a high-volume printer. Ajit Kapoor, director of electronic publishing services for Dataquest, Inc. in San Jose, Calif., said, "I think the true value of the product is that in text mode the print is so dense."

However, Kapoor also said that if Dataproducts wants to use the technology in a higher performance printer with a 20,000 sheet-per-month duty cycle rather than the 5,000 of the SI 480, it probably will have to use a continuous-flow technology instead of the drop-on-demand method.

Kapoor noted that companies like Canon U.S.A. and Howtech, Inc. have developed solid ink printers using slightly different technologies.

Sperry tape unit IBM compatible

From page 19

ered-read; a dual mode of operation including buffered-write and write-immediate modes; and localized error recovery.

The Uniservo 40 with two magnetic tape drives will cost $43,120. The monthly cost for a five-year lease is $1,198 plus $225 a month for maintenance. The 5073 controller will be priced at $65,430. A five-year lease will cost $1,818 per month plus $360 a month for maintenance.

Sorting out 9335 rumors

From page 19

says it will provide free of charge pending delivery of 9335s. And it seems certain that something is wrong with the drive or controller or that something is slowing production at the IBM disk drive manufacturing facilities in England.

There seems to be little agreement, however, about the specific nature or cause of the problems. Several theories are floating about. The first is that the microcode used in the 9335 is, for unknown reasons, slower than the hard wire of the 3370. The second is that a bug in the 9335 microcode locks out all users below certain security levels, regardless of what the System/38's security system allows. The third theory is that since the 9335 requires CPF Release 8, which is said to be set for delivery this week, early 9335 users were given Release 8's disk facility — and that the facility has bugs.

The consensus of consultants who recommend drives to their clients is that the performance problems are real and related to the controller but can be overcome.

"This kind of thing doesn't tell me anything about the reliability of the disk drive, just that there are problems in the logic and controller," notes James N. Porter, president of Disk/Trend, Inc., a Los Altos, Calif., consulting and publishing firm.

David Greenblatt, president of the Dallas consulting firm DGC, Inc., re-

See **SORTING** page 21

The better you understand
the better your company c

The MIS perspective.

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Traditional corporate information systems do a great job managing structured data. Unfortunately, the information most needed by decision-makers is often unstructured—embedded in the text of documents such as letters, reports, and contracts. Because this material has traditionally been beyond the reach of online systems, access to it has been slow, tedious, and error-prone. Word processors and office automation systems, for all their other merits, have been practically useless in making the actual information content of documents available online.

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INQUIRE/Text runs on IBM and compatible mainframes under MVS/TSO, MVS/CICS and VM/CMS.

Marketing goes enterprisewide

From page 19

nies. "IBM is pitching its hardware sales from a companywide point of view," says a user at one such Fortune 500 company. "When it gets down to prices and discounts, the salesmen can help you a lot if you're buying a large volume of equipment."

Analysts claim that enterprisewide marketing programs within IBM are varied but that they all extend throughout a national or international organization.

The EMA, labeled an experimental program by IBM, allowed large customers to obtain discounts on maintenance. There was a catch: Virtually all the computers were covered by IBM — not third-party — maintenance agreements. It worked so well that IBM recently extended the program under the name Corporate Service Amendment (CSA), to all accounts that meet the eligibility requirements [CW, Oct. 20].

Better deals

Yet, larger companies are still getting a better deal. The large enterprises that participated in EMA can waive inspection fees. Other customers who apply for the CSA program must pay $3,500 to $8,500 per site for the inspections to determine whether they are following cost avoidance systems procedures.

Many observers believe that another enterprisewide sales effort is underway in the area of computer-integrated manufacturing (CIM) and engineering. Driving IBM's efforts is the belief, expressed as far back as October 1984, that IBM's scientific-engineering customers want to tie in non-IBM departmental computers into an IBM network.

Many of these departments run Digital Equipment Corp. or Data General Corp., Unix or non-IBM technical computers. Targeting such sites, the 9370s sport a special OEM interface and Ethernet link that ties them into "other ASCII hosts," roughly translated, IBM spokesmen admit, to mean DEC VAXs.

Reaching top levels

But for enterprisewide marketing to work, IBM salesmen must reach the top levels of corporate management. Thus, IBM is placing a "one-stop shopping" center in Dallas to demonstrate CIM applications. It is designed for presidents and chief executive officers who would find a three-stop IBM tour of CIM projects time-consuming.

One software value-added supplier involved in IBM's Marketing Assistance Program says, "It's got to be a meeting with the president. They're the only ones, organizationally, who can tell everyone from the MIS manager to the engineers and the manufacturing guys to work together."

Apparently, IBM's strategy has not been lost on its biggest customers. At a recent demonstration of IBM's CIM technology in Illinois, a senior data systems manager said, "If you want a single-vendor solution, you'd better start by looking at IBM."

Bozman is a Computerworld *contributor based in Chicago.*

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Sorting out 9335 rumors

From page 20

ports he has heard the 9335 "is a drop slower than the 3370" and that the problem seems to center on the controller. David Andrews, president of Andrews, Duerr & Manteghian, Inc. of Cheshire, Conn., says, "I am still trying to decide what to recommend to my clients. Something just doesn't compute here."

One thing that doesn't compute relates to IBM saying it is shipping plenty of 9335s. Many observers in the System/38 market report that they don't know of any customers receiving the drives. So one question to be answered is, Who is taking delivery of all the 9335s that IBM says are going out the door?

That lack of an installed base — or certainly a *talkative* installed base — leaves open the question of who is raising the performance questions. Under normal circumstances, complaints about a product tend to come from the user community. But this time, many of the reports are coming from IBM itself. Overall, it is a situation that calls for the customer to step with care.

Eight-CPU 3090 seen for 1987

From page 19

line, meanwhile, the vendor is expected to add two 4381-class systems by the end of this year or the beginning of 1987. But in the wake of IBM's recent announcement of the 9370, the expected retirement of the existing 4341 series will probably be delayed until the company introduces its 4391 in 1988, Gens said.

Looking ahead to the end of the decade, Gens said he expects the first of IBM's ballyhooed Summit series of high-end mainframes to appear in late 1989, with volume shipments probably beginning in 1990. Initially, Summit will probably consist of two models — a three-way CPU complex rated at 100 MIPS and a six-processor configuration capable of delivering twice as much computing horsepower, he predicted.

Watch what happens next time you ask a mainframe software vendor for a complete customer list.

You may get a convincing song and dance, but underneath it's a different story. Behind those pat answers that software vendor is actually sweating and squirming.

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CCI fills gap in processor line with low-cost office models

By James Connolly

IRVINE, Calif. — Computer Consoles, Inc. (CCI), attempting to fill gaps in its product line, has introduced two smaller, lower cost models of its Power 6/32 superminicomputer.

Designed to support 32 to 80 users, the Power 6/32S and Power 6/32SX are intended to provide an office environment engine to support CCI's Officepower software package. The systems fit into CCI's product line above the entry-level Power 5/32 but below the three earlier controlled-environment Power 6/32 models in terms of price and performance.

"Our design goal was to package very high performance in an economical, small box that not only is well suited for a variety of commercial, scientific and data base management systems applications but operates in a normal office environment," said John Jacobson, vice-president and general manager of CCI's Computer Products Division.

Cost reductions

The reductions in price and size were made possible by limiting the number and size of disk drives and by using smaller power supplies and controllers, according to Harold S. Koplow, CCI vice-president for development planning.

Koplow also said that the systems are the first to incorporate CCI's Multi-Protocol Communications Controller (MPCC), which will be made available at a later date for other Power 6/32 systems.

The MPCC, using a Motorola, Inc. 68000 microprocessor, reportedly permits concurrent use of asynchronous, bisynchronous and bit-oriented protocols, which the company said provides practically unlimited network design options.

The Power 6/32S was designed to process 5 million instructions per second (MIPS) and to be field upgradable to the 8-MIPS Power 6/32SX. The Power 6/32S, priced at $89,950 for a 32-user system with 4M bytes of memory, costs $25,000 less than the 6-month-old, 5-MIPS Power 6/32E.

A 32-user Power 6/32SX with 4M bytes of memory costs $99,950, compared with $214,450 for a basic configuration of the 2-year-old Power 6/32.

The new models reportedly support a physical maximum of 96 users and a recommended maximum of 80 users.

Each system is housed in a cabinet with a footprint of less than 5 square feet and has a noise level of 53db.

Like earlier Power 6/32 systems, the new models run CCI's System V operating system, which is a derivative of AT&T's Unix System V. However, the new systems use Maxtor Corp. 5¼-in. Winchester disk drives, rather than the 9-in. Control Data Corp. drives used in the older systems.

The new models also support a maximum of four 380M-byte drives, rather than the 32 or more 515M-byte CDC drives, and half the 32M-byte maximum memory of the older models.

Analyzing the CCI announcement, Ronni T. Marshak, managing editor of Patricia Seybold's Office Computing Group in Boston, said, "I think it will help them to sell into some smaller corporations. It's nice to have processors to fill the in-between slots." She noted that CCI makes "good Unix boxes," but that the inability to port CCI's Officepower software to non-CCI equipment limits CCI's chances to sell both the software and the hardware.

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SOFTWARE & SERVICES

SOFTALK
Charles Babcock

IBM's sheep in wolf's clothing

At the ADAPSO conference in Phoenix Nov. 3, Bernard Goldstein, a partner with mergers and acquisitions specialists Broadview Associates, created a sympathetic stir among the brass of the independent software companies by saying IBM had staged an acquisition of Hogan Systems, Inc. rather than making a distribution deal.

"If it looks like a duck, walks like a duck, talks like a duck — it's a duck," Goldstein said in remarks directed to IBM Chairman John Akers, who had provided the keynote address earlier in the morning but left before Goldstein took the podium.

The well-known features of the deal have Hogan phasing out its domestic sales force and giving up distribution rights in the U.S. to IBM for the next 20 years. What was not said was that prior to the deal, Hogan had launched a product line that was found wanting by major banks, and that the company was in financial difficulty at the time it signed the deal.

Grave misgivings

Goldstein, as well as many others present, had grave misgivings about the deal. The Hogan deal is not "an isolated incident of IBM filling a small niche. I believe IBM is implementing a strategy to dominate multiple horizontal and vertical software lines," he said.

Robert Berland, IBM's director of strategic planning, faced a line of unfriendly questioning in the same vein when he spoke later in the day about IBM's Oct. 7 product announcements. How is Uccel Corp. supposed to react when it suddenly finds the marketing might of IBM behind its weakened rival?

Berland's answer, which I suspect is

See **IBM's** page 33

Babcock is Computerworld's *senior editor, software & services.*

Insurance tool developed

Expert system evaluates risks, underwrites policies

By Charles Babcock

Three major insurance companies have installed a $450,000 expert system known as the Underwriting Advisor for underwriting insurance policies, the companies said.

A product of Syntelligence, Inc. in Sunnyvale, Calif., the expert system is designed to run on the insurance companies' IBM mainframes. The firms involved are the American International Group, The St. Paul Cos. and Fireman's Fund Insurance Cos.

Each firm was a development partner for a module of the Underwriting Advisor. The fire and allied lines of property insurance module was developed at St. Paul and was designed to help commercial insurance underwriters perform risk evaluation, according to Sheldon Breiner, president of Syntelligence.

The American International Group was where the inland marine and commercial auto module was developed. The Fireman's Fund was the site for the development of the workmen's compensation package. Each module provides similar assistance in the daily task of risk evaluation, Breiner said.

The system attempts to consolidate both industry-standard information and individual company expertise in evaluating risks. It can be accessed by field workers through a user interface on an IBM Personal Computer connected to the host mainframe module.

Cost savings predicted

Breiner claimed the major commercial insurers should see an underwriting cost saving due to use of the expert system.

Syntelligence is a developer of expert systems for banks and insurance companies. It employs 70 systems and knowledge engineers in the development and support of its products, said Ed Sterbenc, the company's vice-president.

The Underwriting Advisor was developed using Syntelligence's artificial intelligence shell and inference engine. It was translated into PL/I for the mainframe version and C for the workstation version, Sterbenc said.

SOFTWARE NOTES

RTI, university ink linkage deal

Carnegie-Mellon University in Pittsburgh and **Relational Technology, Inc.** in Alameda, Calif., have entered a five-year agreement to create a distributed data base environment that will span the university's seven colleges. The environment will give users access to multiple data bases on a variety of mainframe, minicomputer and personal workstations using different operating systems, Relational Technology spokesmen said.

Carnegie-Mellon currently uses 75 Digital Equipment Corp. VAX 780s, eight DEC 2060s, 400 Microvaxes, 1,500 IBM Personal Computers, 2,000 Apple Computer, Inc. Macintoshes and 200 IBM RT PCs, university spokesmen said.

See **NOTES** page 31

On-line package offers Cobol's ease to users of CICS

By Eddy Goldberg

COLUMBUS, Ohio — Goal Systems International, Inc. has announced Quiktask, an on-line, interactive application development system that enables batch programmers with minimal IBM CICS experience to write CICS applications using Cobol language skills.

Quiktask works in a streamlined, Cobol-like procedural language that combines commonly used verbs and an easy-to-use syntax in a product that the vendor claims retains the power of Cobol but eliminates much of Cobol's rigidness and detail.

"The syntax is very similar to Cobol, and Quiktask will accept most Cobol statements," said John Miecielica, manager of technical support at American Insulated Wire Corp., a beta-test site for the product located in Pawtucket, R.I.

The many repetitive and technical cod-

See **PACKAGE** page 32

INSIDE

CGI Systems' large-application generator system gets DB2 support/**31**

IBM bumps System/38 first-level support up to National Service Division/**32**

Uccel sheds unwanted businesses to concentrate in the area of systems and financial software/**33**

NEW THIS WEEK

- Softworks offers VTAM Network Activity Monitor for MVS

For more on this and other new products, see pp. 91-117.

INSTANT ANALYSIS

"I believe IBM is implementing a strategy to dominate multiple horizontal and vertical software lines."
— Bernard Goldstein, partner, Broadview Associates, speaking at ADAPSO's 25th anniversary conference on the IBM-Hogan Systems, Inc. deal

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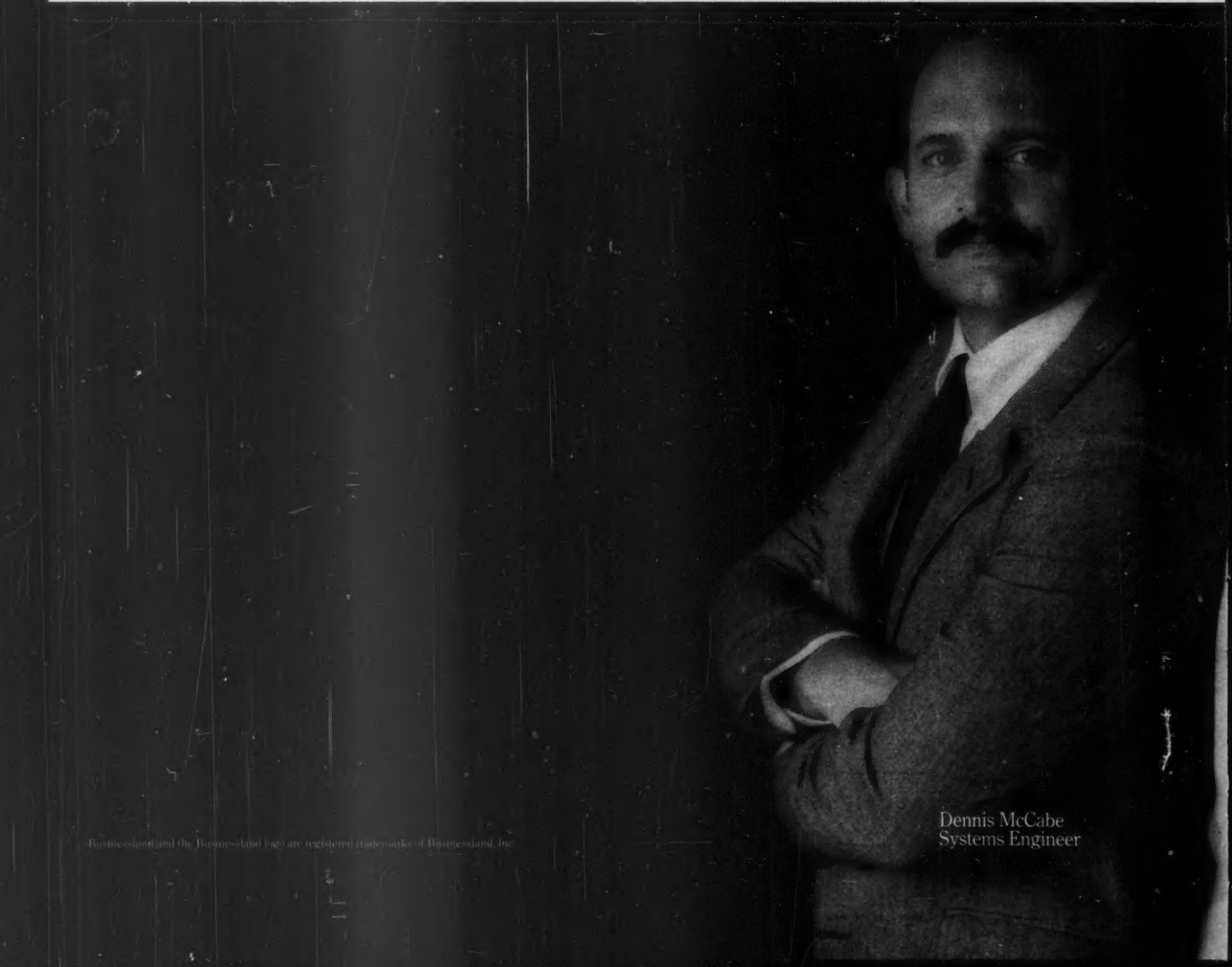

Dennis McCabe
Systems Engineer

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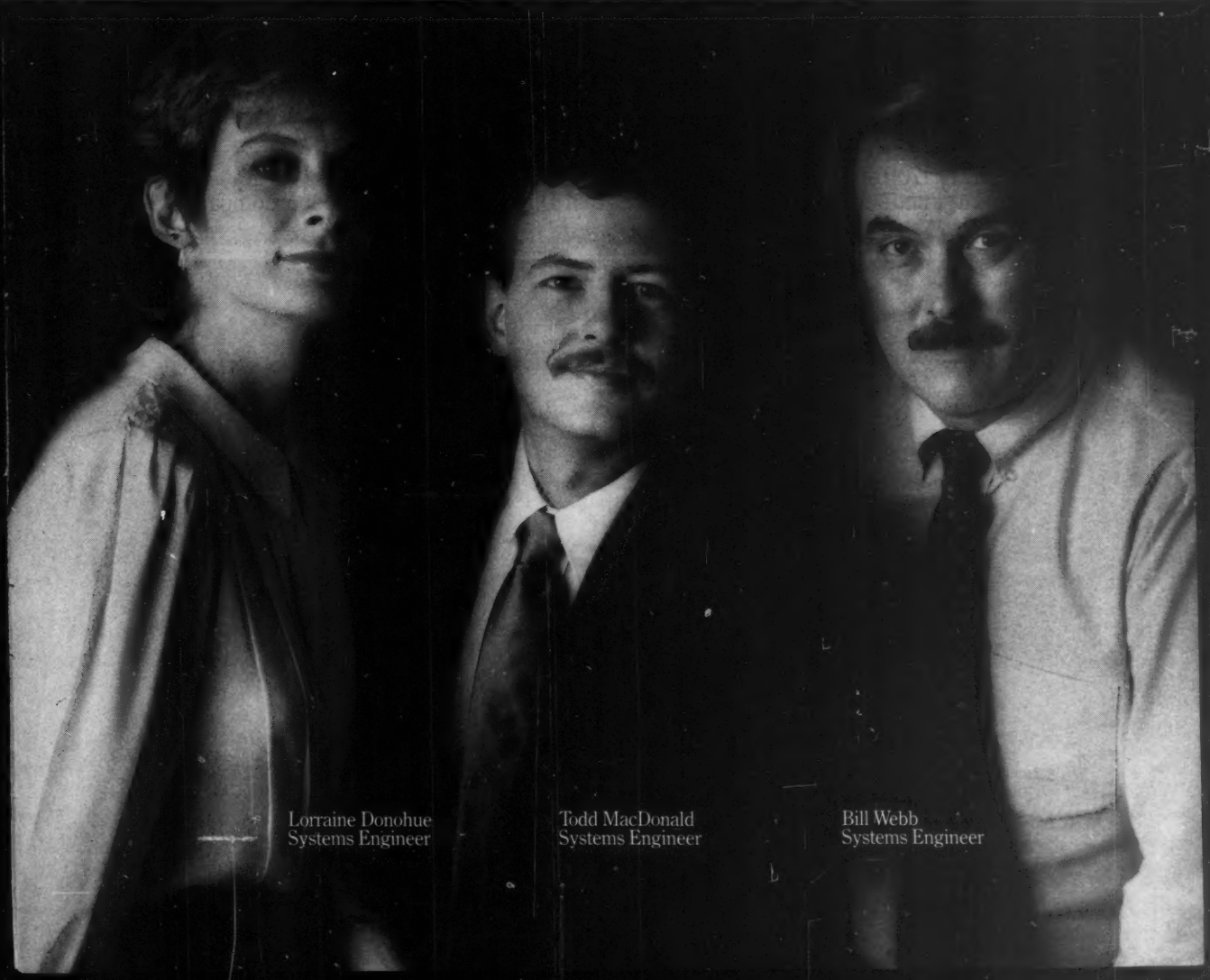

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CGI Systems' large application generator gets DB2 support

By Charles Babcock

PEARL RIVER, N.Y. — Support for developing DB2 applications has been added to a large, dictionary-based application generator, Pacbase, from CGI Systems, Inc.

Applications are developed in Pacbase's own nonprocedural language, which is more like English than Cobol but not as similar to English as Focus or Ramis II information center systems, said Hugh Saxton, CGI spokesman. The application source code can be compiled by most Cobol compilers into a Cobol application and run on IBM mainframes, he said.

Pacbase users complain that the Pacbase language is both unfamiliar and requires a long learning curve, and Saxton acknowledged "It's not an easy one to learn." But he added that once the Pacbase approach is adopted, applications completed under it are independent of any single brand of hardware, operating system, teleprocessing monitor or data base management system. Programs generated for one environment may be run in another through recompilation, he said.

The support for DB2 under Pacbase includes:

- DB2 data bases that can be described using the system's standard data definition capabilities, CGI spokesmen said.
- All SQL commands for file access will be created and embedded within the generated Cobol programs.
- Pacbase will generate all CREATE statements required by DB2 for accessing the data base, CGI spokesmen added.

The DB2 support includes dictionary control over DB2 definitions, with cross-referencing and key-word search capabilities.

DB2 support is priced at $18,000 for the IBM DOS/CICS environment, $20,000 for the IBM MVS/CICS environment and $25,000 for the IBM MVS/IMS environment.

DB2 support is consistent with the facilities provided by Pacbase for other IBM and non-IBM file structures and DBMS, including IBM's VSAM file management system and DL/1 data base management system and Cullinet Software, Inc.'s IDMS/R data base management system.

In developing applications with Pacbase, the data description and system specifications are entered into the dictionary, which helps automate and control system specification and design.

The development system automatically creates screen maps, Cobol programs, data base descriptions and error messages from the specifications.

Pacbase competitors

The ADAPSO report on Software Development Technology by John Landry said Pacbase competes with Telon from Pansophic Systems, Inc., Sage Systems, Inc.'s APS, Use-It from Higher Order Software, Inc. and Tarkenton Software, Inc.'s Gamma.

The ADAPSO report said a dictionary-oriented application generator makes it easier to maintain an application by updating the dictionary.

At each stage of development, the dictionary imposes control over specification consistency, the report said.

"A disadvantage is that an additional copy of the data dictionary is required if interfaces to existing dictionaries are not provided," the report added.

Pacbase originated with CGI Informatique in Paris and was introduced into the U.S. in 1983. The 65 to 70 users of the product in the U.S. include the Cigna Corp., Electronic Data Systems Corp. and Irving Trust Co., according to CGI Systems spokesmen.

Pacbase is sold for $140,000 for the DOS/CICS environment, $197,000 for the MVS/CICS environment and $260,000 for the MVS/IMS/DC environment.

Notes: GSA aids federal growth

From page 27

The **U.S. General Services Administration** (GSA) has established a **Programmers' Workbench** program to help federal agencies with software development. The GSA will use the **Rand Information Systems, Inc.** Development Center to integrate a set of software development tools for the agencies' use. The Workbench is in use at the Social Security Administration in Baltimore and the Defense Logistics Agency in Columbus, Ohio.

■

Oracle Corp. has announced **Easy SQL**, an end-user interface for its Oracle relational data base management system. The interface uses point-and-select techniques with pop-up windows, function keys and flexible menus. A mouse is available for use with the IBM Personal Computer, company officials said.

■

Spokesmen for **Pro Computer Sciences, Inc.** of Laguna Hills, Calif., maker of the Pro IV fourth-generation language recently ported to the **IBM System/36**, says one of its value-added resellers (VAR) is preparing a line of Pro IV applications for the first quarter of 1987. The VAR is Application Systems Corp.

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An October, 1986 IBM Programming Announcement called it MVS Migration System*. CTG's 1985 announcement called it CORTEX**. In both cases, IBM users were told of a DOS to MVS conversion solution unlike any other available in the US marketplace.

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System/38 support moved to national center

Deal covers operating systems, Cobol, Basic

WHITE PLAINS, N.Y. — IBM recently announced that it is making its National Service Division IBM Support Center the first level of support for selected System/38 programs.

Included in the support program are the Control Program Facility operating system for the System/38, RPG III programming language, Cobol and Basic.

Interactive Database Utilities, Remote Job Entry Facility, Conversion Reformat Utility, and 11 others are also included under the support program, according to the IBM announcement.

Customers who experience problems or malfunctions with any of the designated programs will be able to call the National Service Division 24 hours a day, seven days a week instead of relying on their initial licensing location, IBM spokesmen said.

In addition to 24-hour hot line support, the service structure now includes:

- A Software Support Facility data base for quicker problem solving.
- Guidance to customers in preparing Authorized Program Analysis Reports.
- Information on temporary fixes or circumventions.

The Support Center will send tapes of fixes that can be identified, IBM reported.

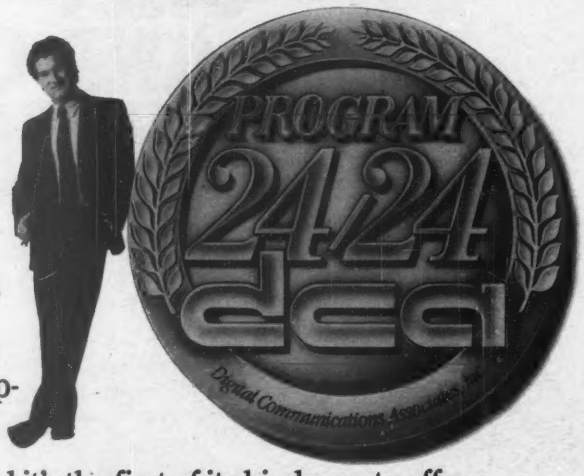
Those problems that have not been previously identified will become the target of an Authorized Program Analysis Report.

This report will be used in future calls to the center, according to IBM spokesmen.

The IBM support center will not provide support for planning software installations or software glitches related to user programs, the IBM spokesmen said.

The center also will not support field-developed programs or industry application programs, spokesmen added.

Announcing the Network Premiere of 24/24.



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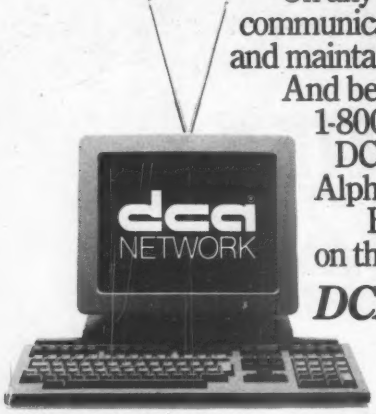

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Package offers Cobol's ease

From page 27

ing requirements of command-level CICS, especially in pseudo-conversational techniques, have been simplified in Quiktask, Miecielica said. "Quiktask lets you concentrate on the problem, not on the technical expertise needed to solve it."

Miecielica said the gains are higher for beginning and intermediate programmers than for more experienced CICS programmers who write code faster anyway. He added that he thinks Quiktask will replace command-level CICS development code for in-house use, though third-party programmers will continue to deliver products in command level for compatibility purposes.

Quiktask includes 10 integrated subsystems. The full-screen editor subsystem checks for syntax errors, validates data name references and provides help. The test and debug subsystem allows programmers to interactively debug programs in an on-line environment.

'Pinpoints errors'

Miecielica said using Quiktask's debugging facility is easier than using IBM's Execution Diagnostic Facility because Quiktask's facility "pinpoints your errors and lets you go in and test every line of code if you have to."

Quiktask provides programmers with greater flexibility and control, allowing them to step through each line of code, executing it to see how it performs; to jump around in the program; and to change values on-line during execution, he added.

The screen painter subsystem, which replaces Basic Mapping Support (BMS), allows programmers to quickly create or change maps, both for Quiktask and for existing Cobol applications. Quiktask can also generate standard BMS maps from the screens if needed.

On-line screen painting is much easier with Quiktask than with BMS, because Quiktask allows programmers to call up a screen and simply "type in what you want where you want it," Miecielica said.

Subsystem available

Quikexec, the subsystem that executes all Quiktask applications, is available as a separate option for users who do not require the full Quiktask system. The remaining subsystems are interactive on-line Help and training — with more than 1,400 Help screens as well as examples that can be accessed with a program function key at any time from any screen — dictionary, language, translation and utilities.

Quiktask runs under MVS and DOS/VSE on IBM mainframes using CICS Release 1.5 and higher. It can interface to existing Cobol-callable routines, subroutines and copy books and does not require compiles, link edits or any preprocessing steps.

Quiktask is scheduled to be available by the end of the year. It will be priced at $35,000 for DOS/VSE and $44,800 for MVS. Quikexec purchased separately will cost $17,500 for DOS/VSE and $22,400 for MVS. Installation takes one to four hours and uses three VSAM files, according to Goal officials.

IBM's sheep in wolf's clothes

From page 27

close to IBM's official line, was: "I would hate for anybody to say, 'Oh gee, IBM went into that area, I better do something else. I know there are concerns about it, but where is there any evidence in any area where it's really been a detriment?' "

The teleprocessing monitor market springs to mind as an area in which mild competition once existed but has since faded away. Many industry observers say they believe that IBM is pulling off its drive to establish DB2 as a strategic product among its MVS/XA customer base, and that this drive is to the detriment of independent vendors.

But what is wrong, an impartial observer has to ask, with IBM competing in specific markets? After all, the independents have been happy to follow the operating system environments created by IBM, filling niches and offering add-on products and applications.

Have the independent vendors, one must ask, after many years of 20% growth, just discovered that this world was created by IBM? The answer, I think, is supplied by Stuart Miller, president of Software AG of North America, Inc., and Goldstein himself. The relationship between IBM and the independent companies is not so much the feudal one of lord and vassal as the more sympathetic and symbiotic relationship between project manager and talented programmer.

"When you think about it," Miller said, "the best software packages have come from software companies or from the customers, not from the rigidly planned hardware cycle."

Constant innovation

Miller says that he sees the hundreds of competing software companies as constant sources of innovation, providing the marketplace with a surplus of products — from which natural selection chooses the best.

Goldstein noted the way this process benefits IBM when he said, "Your [IBM's] market share has drawn us to develop a vast array of software products for your users, to the detriment of your competitors."

Indeed, IBM's first line of defense is in the same vein: "I think it's healthy to stimulate competition. My experience is when we go into an area, we typically stimulate it for everybody," Berland told the ADAPSO audience in response to the same question.

This would be a high standard to which we might hold IBM. Do its moves into the software arena stimulate competition and widen opportunity or do they stifle it?

Does Big Blue see the value that independent software companies have been adding to its hardware product lines or is it merely interested in enlarging its share of the revenue?

Is the giant expanding the market or merely practicing account control — this time in software?

These are not easy questions to answer, given the weakness of Hogan Systems at the time of the IBM deal, but they certainly bear asking again and again.

Uccel sheds businesses, narrows focus

By Charles Babcock

DALLAS — Uccel Corp. has divested itself of seven businesses since last September and will concentrate now on systems and financial software, according to Layne Bradley, Uccel's vice- president of product marketing.

The seven businesses represented $108.7 million of 1985's $204.7 total revenue. Their divestment leaves Uccel with 75% of its business devoted to systems software and 25% to banking and financial applications, Bradley said.

In addition, the company, with $90 million in cash and no bank debt, is acquisition hungry and can be expected to acquire promising companies in the systems and financial application field, he added.

'Very profitable'

"We have downsized. We have tried to get positioned to become very profitable," Bradley said.

During the past 13 months, Uccel has acquired Software Corporation of America, located in Herndon, Va., a maker of direct-access storage devices management software; Corodale, Inc. of Boston, with its tape manager, scheduler and disk management products; and Conversion, Inc., with its DOS-to-MVS conversion packages, according to Bradley.

IBM and Uccel have a joint marketing agreement that allows IBM to market the conversion software as part of MVS Express, its line of MVS conversion aids, Bradley said.

IBM estimates that 500 conversions occur each year from DOS to MVS, but Uccel's experience is that 300 to 350 convert per year, Bradley added.

He said the Systems Software Division of Uccel is averaging 30% growth this year and that it can continue to do so as long as it "doesn't stray far outside the data processing center, resource management area."

The company as a whole, which lost one cent per share in 1983, is expected to make $1.35 a share in 1987, according to Wall Street analysts, Bradley said.

Disk storage, with an average industry growth rate of 40 percent a year*, is the fastest growing component of most IBM mainframe installations. And, personnel costs to manage disk storage are rising rapidly as well. The ASM2 Automated Storage Management software curbs expensive DASD growth and allows you to gain control of this valuable asset.

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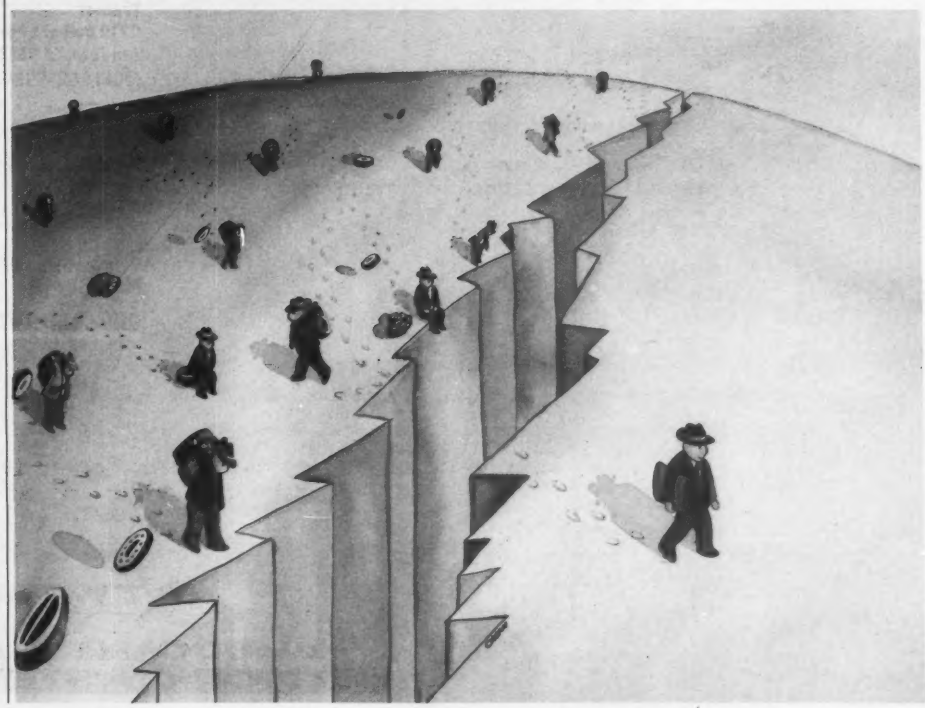

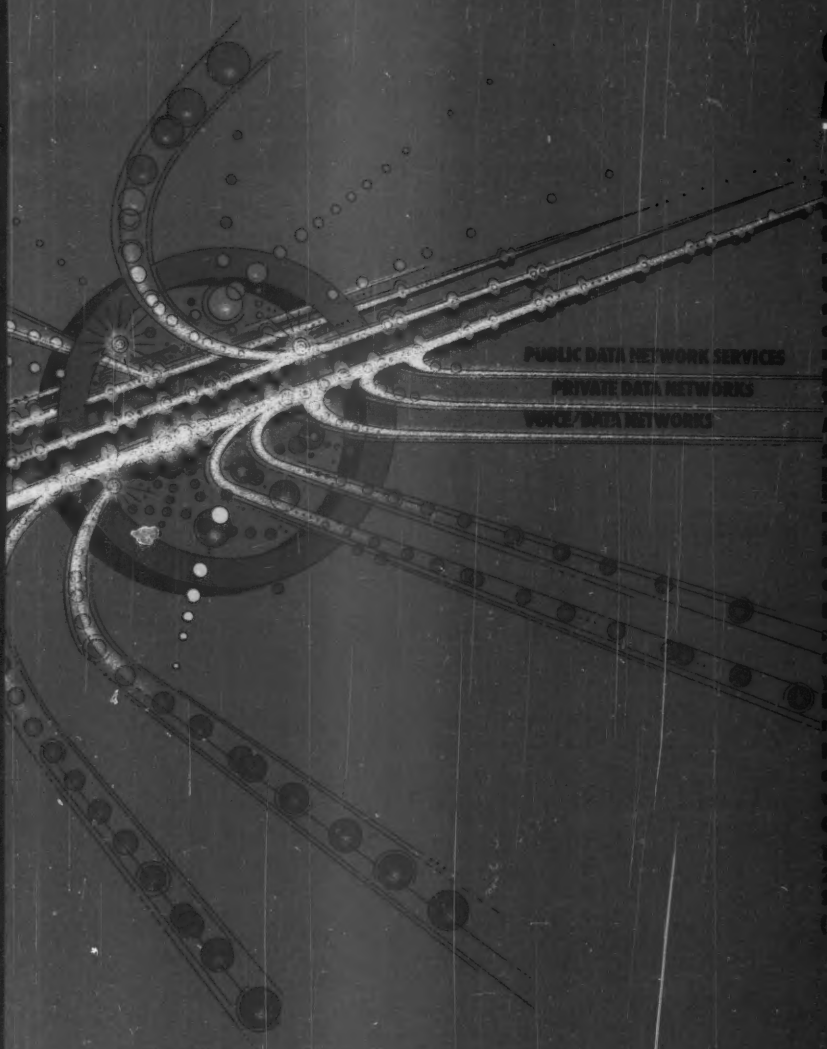

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DATA STREAM
Daniel J. Rosenbaum

AT&T finds grass less green

By now, you have probably heard that AT&T gathered its top 22 officers on Cape Cod in Massachusetts recently to figure out where the company should be going. That meeting points to some significant changes in AT&T's future strategy.

For one thing, it may signal the company's deemphasis of or even eventual withdrawal from the computer business — or at least the computer business as most people envision it.

The meeting resulted in the compilation of 50 action items centering on three priorities: to strengthen and enhance the profitability and position of AT&T's core business; to deploy a "new generation of data networking solutions to customers"; and to establish a "major position" in international markets. Each bears close examination.

First of all, what is AT&T's core business? According to an internal, nonproprietary publication circulated to management, the core of AT&T is in domestic long distance, central office equipment and "customer premises telecommunications equipment." Everything else, according to the executives' manifesto, is subordinate. If a venture does not support those businesses or if it is not making money on its own, AT&T will abandon it.

AT&T realizes that its core businesses are characterized by low growth and are subject to worldwide competition. Once the core businesses are reasonably secured, the company will expand into

See **AT&T** page 37

Rosenbaum is executive editor of "Wiretap," a computer industry newsletter published in Morristown, N.J.

SNA integration promised

Analysts predict IBM open architecture, connectivity

By Stanley Gibson and Elisabeth Horwitt

MIAMI BEACH — At a recent invitation-only meeting with industry analysts, IBM expanded on the crucial role that Systems Network Architecture (SNA) would play in the company's networking strategy and reemphasized plans to use emerging industry standards to integrate other vendors' products into its SNA architecture.

An IBM spokesman laid out the seminar's dominant theme in the opening remarks, saying that IBM "views telecommunications as a subset of information processing," according to David Terrie, president of Boston-based Newport Consulting. "For IBM, telecommunications means data and voice. [IBM] realizes that if it doesn't provide connectivity, there will be less for SNA and for Netview [an IBM SNA-based network management system] to do," Terrie said.

Several analysts were led to conclude that Advanced Peer-to-Peer Networking (APPN), an LU6.2-based peer-to-peer protocol, will be a cornerstone of the vendor's networking strategy. While APPN currently runs only on IBM System/36 and 38 machines, it will eventually be extended to all IBM architectures, according to Claire Fleig, a consultant with International Technical Group in Palo Alto, Calif.

While there will be an APPN host interface, APPN will not be used to communicate with IBM hosts, she added. Hosts will perform batch processing and network management through Netview, while minis, micros and private branch exchanges

See **SNA** page 36

LAN fiber-optic options debut

By Peggy Watt

DAYTON, Ohio — Fox Research, Inc. last week announced fiber-optic options for its 10-Net Ethernet local-area network (LAN) as well as a new LAN-to-mainframe gateway.

A major component of the introduction was the 10-Net Fiber-Optic Board, which connects with either fiber-optic cable or the standard twisted-pair wiring used with Fox's 10-Net LAN, said Ed Schulz, Fox engineering director.

Also announced were the 10-Net Fiber Optic Hub, which can connect eight nodes, and 10-Net Fiber-Optic Repeater, which can link a mixture of fiber-optic and twisted-pair 10-Net LANs.

The fiber option was added to the product line to accommodate customers concerned about security or problems with electromagnetic interference, such as lightning, especially in a factory environment, Schulz remarked.

See **LAN** page 36

Telenet announces completion of data network service unit

By Mitch Betts

RESTON, Va. — Telenet Communications Corp., the data network service unit of U.S. Sprint Communications Co., is officially complete, the company announced recently. The new organization is composed of customer bases and facilities of two former packet-switching services, GTE Telenet Communications Corp. and United Telecommunications, Inc., formerly called Uninet.

The merger is part of an agreement finalized last July by parent companies United Telecommunications, Inc. and GTE, which are currently in the process of merging their voice communications networks and customer bases as well. U.S. Sprint is the parent company of both sets of mergers.

"Migrating each Uninet customer [to the Telenet network] was a delicate opera-

See **TELENET** page 37

INSIDE

Gateway offers SNA link for public data networks/**39**

Low-cost Ethernet LAN server debuts for VAX/**39**

NEW THIS WEEK

- Ideassociates expands its Ideacomm product line
- Codex introduces a multifunction SNA gateway

For more on these and other new products, see pp. 91-117.

INSTANT ANALYSIS

"IBM sees support of communications standards not as an end in itself but as a way to ensure that its systems have more to do — like network management and holding more data bases."

— David Terrie, president, Newport Consulting, Boston

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LAN offers fiber optics

From page 35

The optical-fiber-based LAN can use the same software as the original 10-NET, he added. Both LANs run at 1M to 2M bit/sec. and support Microsoft Corp.'s MS-DOS 3.1 and 3.2 applications.

One of the first implementations of the optical-fiber products occurred at Potamkin Chevrolet in Philadelphia. The company chose the medium partly for its ability to carry signals over distance without the need of a repeater.

Potamkin used optical fiber to link three buildings; the farthest of these was 1,300 feet away from the main building, he said.

Another early installer of the product was Bruzaud Associates, a Lake Hopatcong, N.J., consulting firm that specializes in assembling systems for car dealerships. Bruzaud used Fox's optical fiber-based 10-NET to network six IBM Personal Computer workstations and a PC XT server running a vertical market data base.

Fighting failures

Fiber was the best choice to combat recurring equipment failures because of seasonal lightning storms, said company President Lyn Bruzaud. "You can't have repeaters blowing up every summer because of lightning storms. The fiber-optic cable was more expensive but should prevent that.

"The only risk appears to be if a fiber-optic cable soaks in water," Bruzaud added. "It could steam up like glasses in a shower."

The Fiber-Optic Repeater is available now for $795. Both the Fiber-Optic Board, priced at $995, and 10-Net Fiber-Optic Hub, at $1,995, will be available early next year, Schulz said.

Gateway products

Fox Research's new gateway products include the 10-Gate Systems Network Architecture (SNA) Turbo Gateway and 10-Gate SNA Binary Synchronous Communications (BSC) Turbo Gateway, priced at $1,995 each. Each consists of the 10-SNA Stand-Alone and 10-BSC Stand-Alone.

The 10-SNA Turbo and 10-BSC Turbo gateways both cost $1,095. The 10-Community Automatic Exchange direct connection costs $795.

Although 10-Net LANs previously had gateway capabilities, the new boards are intelligent, with a built-in 6809 microprocessor and 56K bytes of memory, Schulz said.

Upgrade discounts

Fox will offer upgrade discounts on an individual basis to existing customers.

All gateways are to IBM and compatible hosts, but Schulz said Fox expects to add gateways to Digital Equipment Corp., and possibly NCR Corp. and other environments, as well as explore ways to accommodate Apple Computer, Inc. Macintosh systems on the 10-Net.

The new gateway technology is provided through a new OEM agreement with Information Technologies Inc. in Scottsdale, Ariz.

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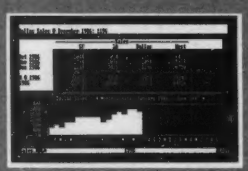

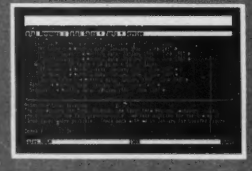

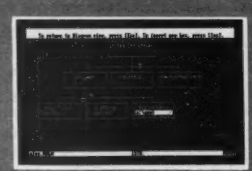

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SNA integration promised by IBM

From page 35

(PBX) can use APPN to talk together. In particular, IBM dropped hints that APPN will be the peer-to-peer networking interface for all low-end systems, according to analysts.

IBM "made a fairly convincing case" that it is opening up its architecture to other vendors and to industry standards, Terrie said. "A couple of years ago, support of [industry communications standard] Open Systems Interconnect was just a way for IBM to hedge its bets. Now it has realized that the old strategy of trying to shut other vendors out by staying proprietary is self-defeating."

Following parent IBM's direction toward standards support and open communications architecture, Rolm Corp. announced that it would support Integrated Services Digital Network (ISDN), the emerging digital telecommunications standard. By establishing a hook into ISDN through Rolm, IBM will be able to further its strategy of bringing PBX and other telecommunications equipment vendors into its Netview network management system, Terrie claimed.

Analysts differed on the clarity of IBM's overall presentation. "It was a very wishy-washy presentation from IBM," said Rudolf Strobl, a consultant with Arthur D. Little, Inc. in Cambridge, Mass.

In contrast, Terrie said the seminar provided at least a basis for better understanding how different pieces of IBM's SNA strategy fit together. "You usually get different answers from different divisions about what does what because IBM people have yet to fully absorb the new positioning of products," Terrie said.

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AT&T finds grass less green

From page 35

data networking.

AT&T has always had a unique point of view on data networking. Remember that data transport and networking was AT&T's original excuse for building computers — an otherwise forbidden field between 1956 and 1983.

The company proposes a single computer architecture and open standards that would "allow customers to connect their equipment, systems and information sources."

The strategy could be seen as AT&T's farewell to the IBM Personal Computer-compatible market, since "single architecture" in AT&T parlance means Unix.

There will still be desktop workstations in the AT&T product line, but they will be designed to run Unix, with Microsoft Corp.'s MS-DOS either not available or not emphasized.

For that matter, it has always seemed odd that AT&T sells computers without modems or network interface cards built in.

The Triad

The international arena is AT&T's third strategic goal. It intends to make its stand in what it calls the Triad — North America, Western Europe and the Far East.

AT&T will continue to be active in the international standards arena — innovating but making sure it gets worldwide approval for its innovations. It is a sound idea; if you can't bludgeon the world into following your standard, like IBM has with Systems Network Architecture, you have to cajole it.

IBM, of course, is famous for going its own way regardless of what the rest of the world does, which you can do if you're bigger than the rest of the world.

The upshot of all this is another set of wrenching changes in the offing for AT&T. The recent force reduction plan is only the first tremor, intended to whip the core businesses into shape. The secondary businesses have yet to be addressed, and the folks in AT&T's marginal businesses should start getting their resumes ready.

To know precisely which of AT&T's businesses face the ax is to know precisely how each of the company's businesses could fit the strategic goals.

No complete answers

I have no complete answers; for that matter, I do not think AT&T has any yet either.

I do have some questions, though, such as these: Does AT&T bring anything special to the manufacturing of microprocessors that can't be duplicated by outside vendors? Do advanced computer graphics serve the strategic goals? Is much of AT&T Bell Laboratories' research germane to the new AT&T?

AT&T has decided that its pockets are not endlessly deep and that it is time to keep an eye on the budget. The company is trying to set a coherent direction — something that has been missing from the corporate culture since Computer Inquiry II.

Telenet service unit completed

From page 35

tion," said Floyd Trogdon, Telenet's vice-president and general manager of network services, in a recent interview.

He said Uninet had about 200 customers, who were moved one-by-one to an upgraded Telenet network from July 1 to Nov. 1, a period of 120 days.

Trogdon said Telenet's goal was to make the transition virtually transparent to Uninet customers.

Specialized network interface

He explained that Telenet developed a specialized network interface to accommodate both networks' logon procedures.

Uninet customers were not required, therefore, to acquire any new software or hardware to use the new merged Telenet network.

Uninet customers "were not required to change their equipment, nor were they required to lease additional lines during the migration period," Trogdon added.

Public data network

The merger prompted Telenet to design a new network to handle the additional network. This has resulted in a public data network that has 25% more traffic than GTE Telenet's network, officials reported.

The larger Telenet network has 45 additional access centers, allowing nationwide access from nearly 18,000 local telephone exchanges and 70 international locations.

In addition, 27 existing access locations were upgraded to offer 2,400 bit/sec. service, bringing the total number of 2,400 bit/sec. access centers to 105.

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COMMUNICATIONS

'Gateway bridge' to offer SNA link over public data networks

By Rosemary Hamilton

IRVINE, Calif. — Gateway Communications, Inc. will announce this week an enhancement to its networking software said to allow remote personal computers access to an IBM Systems Network Architecture (SNA) environment through a packet-switching public data network.

The enhancement, the name of which has not yet been announced, was dubbed a "gateway bridge," as it links two of the vendor's gateway products, G/SNAnet and G/X25Net, at no extra cost, a spokesman said. The capability will be available in December.

G/SNAnet and G/X25Net are designed to work with the vendor's IBM Personal Computer local-area network (LAN) offerings, G/Net or G/Net Plus. The enhancement would enable G/Net to access an IBM host through network services such as Telenet Communications Corp., which uses the CCITT X.25 packet-switching protocol. This option would be especially useful to remote sites without enough data traffic to cost-justify a dedicated link to the IBM host site, Gateway said.

At a typical user site, one personal computer on a G/Net LAN would be designated as the communications server. It would run the enhanced version of G/SNAnet, with access to the mainframe host via a direct coaxial cable, and it would also run the enhanced version of G/X25Net, giving it access to public data networks.

Nodes on a remote LAN can access the mainframe via G/X25Net software running on one of the LAN's personal computers. The remote G/X25Net communicates via a public data network with the G/X25Net software residing on the communications host at the home site. The G/X25Net product, a controller board with associated software, contains the Packet Assembler/Disassembler function to access public data networks.

Once a connection has been established, the remote LAN then has access to the G/SNAnet software on the home LAN, which communicates directly to the mainframe host. The interface enhancement, built into both products residing on the communications host, would establish an SNA connection for the remote user. The personal computers on the remote LAN are, in effect, functioning as terminals in an SNA environment.

Prior to this enhancement, a remote user needed a dedicated line to access the mainframe host. As a Gateway Communications customer, the user would have also needed the G/SNAnet product. With this week's announcement, only one G/SNAnet product is required for up to 32 users.

The G/SNAnet product ranges in price from $2,530 for up to eight users to $4,530 for up to 32 users. Another G/SNAnet package is required for additional users.

The G/X25Net product costs $2,495, and the G/X25 personal computer product, which would be used at a remote site with only one personal computer, costs $1,395.

Ethernet servers unveiled

Designed to provide low-cost VAX tie

By Elisabeth Horwitt

MOUNTAIN VIEW, Calif. — Two Ethernet local-area network servers recently unveiled by Bridge Communications, Inc. were designed to provide low-cost communications between a Digital Equipment Corp. VAX host and asynchronous or bisynchronous workstations, using Transmission Control Protocol/Internet Protocol (TCP/IP).

The Integrated VAX Ethernet Communications Server (IVECS)-TCP/IP is a single-board server that plugs into a VAX Unibus slot. "We've encountered a high level of demand among our users to bring down the cost of TCP/IP networking and of our VAX-Ethernet connection," Bridge President William Carrico said.

Based on a 12-MHz 68000 Motorola, Inc. chip, the intelligent IVECS board integrates the VAX VMS environment with TCP/IP at the bus level but also off-loads all networking functions from the operating system, Carrico added.

This contrasts with software and semi-intelligent board Ethernet-to-VMS products that force the VAX to use up a lot of cycles on network chores, he claimed.

Another advantage of IVECS is the fact that, because it requires no software on the VAX, users have no need to update the interface every time DEC releases another version of VMS, Carrico pointed out.

IVECS-TCP/IP emulates up to six DMF 32 I/O controller cards while establishing a direct connection to Ethernet. It is fully transparent to VAX VMS or Unix operating systems. It also handles protocol processing, unlike DEC's Deuna card, which "forces the VAX host to handle all protocol processing itself, thus reducing its response time for other applications," Bridge Communications claimed.

Priced at $5,900, IVECS-TCP/IP provides VAX connections for up to 48 devices that have been linked to an Ethernet local-area network via Bridge communications servers.

Bridge also announced Communications Server/200-TCP/IP, a general-purpose server that connects multiple terminals, personal computers, printers, modems or host computers to a Bridge Ethernet running TCP/IP. Ports can be configured individually to handle either asynchronous or bisynchronous protocols.

The server supports between four and 10 ports, eight sessions per physical port and up to 40 sessions per server. The 10-port version is priced at $2,800, delivering a per-port price of $280.

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MICROCOMPUTERS

MICRO BITS
William F. Zachmann

Bright outlook for Windows

By 1990, chances are that if you use a personal computer (most of us will), you will be using a graphics interface more like the Apple Computer, Inc. Macintosh (only in color) rather than the character-oriented DOS command interface of today's IBM and compatible systems. At this point, the odds-on favorite for providing that interface is undoubtedly Microsoft Corp.'s Windows. So, getting started with Windows now is likely a good idea for micro center management and support personnel who want to be prepared to assist their users in the years ahead.

Priced at $99, Windows is an operating environment that rides on top of Microsoft MS-DOS and IBM PC-DOS. It builds a graphics interface between the operating system and the user that supports pointing devices (typically a mouse), icons, pull-down menus, dialogue boxes and multiple windows.

All these are essential elements of the easier-to-use interfaces strategy pioneered by Doug Engelbart and his colleagues at Stanford Research Institute in the early 1970s. Developed further at Xerox Corp.'s Palo Alto Research Center (PARC) in the 1970s, this type of interface was first brought into large-scale successful commercial use with Apple's Macintosh.

There is absolutely no question that many people find object-oriented graphics interfaces much easier to learn and use than the older command-oriented systems. One of the reasons

See **BRIGHT** page 44

Zachmann is vice-president of research at International Data Corp.

PC AT 386 board released

Seattle Telecom lifts ATs to next technology level

By Peggy Watt

SEATTLE — An Intel Corp. 80386-based expansion board designed to boost IBM Personal Computer AT-class machines into the next technological level was to be unveiled by Seattle Telecom & Data, Inc. last week.

The STD 386 board, which a company spokesman said will be priced at approximately $3,500, includes 2M bytes of on-board random-access memory (RAM) expandable to 16M bytes and an Intel 80286 bus emulator unit to be compatible with AT-class systems, according to Joe DeCaro, Seattle Telecom president.

It will run in 6-MHz and 8-MHz modes, also for compatibility, and will take one expansion slot.

With a ribbon cable, the board plugs into the 80286 socket on the PC AT motherboard. The STD 386 will accommodate an Intel 80387 math coprocessor when available and supports an Intel 80287 chip in its place until then, DeCaro said. It is scheduled to be available in January.

But Seattle Telecom does not expect the first takers to be users of Intel 8088 or 8086-based systems, which cannot directly use the board. DeCaro said he aims for the earliest buyers of IBM PC AT and compatible systems, who are the first to latch onto the latest technology but are not ready to ditch their 80286 systems for the earliest 80386 machines.

"The AT owners are the pioneers to a new technology," DeCaro said. "They're likely to go for this early."

He said the STD 386 board should accommodate any new operating system or other advanced features being developed for the 80386 chip. The board supports the AT's real mode and protected mode software environments.

The newest product joins a multiple-speed 80286-based expansion board, the PC-286, and Top Board, an expanded memory specification board already marketed by Seattle Telecom.

All boards also support Microsoft Xenix, and the PC-286 board can run Xenix in protected mode. Those earlier boards are the ones intended primarily for users seeking to extend the life of their 8088- and 8086-based systems, according to DeCaro.

Eurosoft gives Mac Unix function

By Eddy Goldberg

SARATOGA, Calif. — Eurosoft International, Inc. has introduced Macnix, a software shell that allows Apple Computer, Inc.'s Macintosh personal computer to function as a Unix workstation.

Macnix implements a client/server distributed system, with the Unix machines as servers for Macintosh workstations. It reportedly allows users to access both Unix and Macintosh applications and facilities using the Macintosh interface, based on graphics, menus, windows and icons.

"Macnix gives the Macintosh Unix functionality," according to Bill Sullivan, Eurosoft's marketing vice-president. "It looks like an ordinary Macintosh to the user but it's Unix." In addition, Macnix users can copy files back and forth between Macintosh and Unix machines via icons, he said.

Macnix consists of two modules. The Macnix server resides on the Unix machine and supplies services to Macintosh workstation requests. The Macnix client, a driver process residing on the Macintosh terminals, produces requests for the server. It is composed of a central operating module, a command configuration module and a command definition and activation module.

Macnix uses a system of object types to create menu and command options specific to the selected object. However, operations on Unix objects are possible only when they are in an executable Unix directory, while Macintosh files are only operational in Macintosh folders.

See **MAC** page 48

NEW THIS WEEK

- Wang introduces laptop
- MCBA offers Report Writer with Data Bridge

For more on these and other new products, see pp. 91-117.

INSTANT ANALYSIS

'They are pretty tight-lipped on that kind of stuff, especially to their betas, because they know people are always knocking on our doors for information.'

— Bob Merkel, an Ashton-Tate beta tester and systems engineer for Professional Automation Systems, on Ashton-Tate's strategy for the next-generation Microsoft Corp. operating system

Datacopy seeks to create electronic image industry standard

Products aimed at OA, publishing markets

By Eddy Goldberg

MOUNTAIN VIEW, Calif. — Datacopy Corp. recently announced a flurry of electronic imaging products aimed at the office automation and electronic publishing markets.

In an attempt to create a standard in the electronic imaging industry, Datacopy announced it is completing development of Prescript, a high-level programming language designed to perform complex image processing functions through calls from office automation programs.

"We don't know if it will make it as a standard, but it stands a good chance," said James P. McNaul, vice-president of strategic planning at Datacopy. He said third-party manufacturers complain that all the scanner manufacturers use different command sets, requiring them to write a device driver for each product. Prescript, offered as a standard language in the public domain, is intended to solve this problem.

Prescript consists of four elements: a high-level language describing the imaging functions to be performed; an interpreter to translate the Prescript commands into a set of imaging commands; a signal processing router-scheduler that manages the image processing operation; and a set of algorithms that provide the image processing functions.

Combined with dedicated image processing hardware and firmware, Prescript could be used during page composition to perform halftoning and scaling, according to Rolando Esteverena, Datacopy's president and chief executive officer.

"Prescript is intended to accelerate market expansion," Esteverena said. It will be available as a language manual in January, with prototypes available for developers in February and production scheduled for April. Esteverena said the language and an interpreter will be available for a $1,500 one-time charge.

Datacopy also announced Microfax, a facsimile communications board and software that allows IBM Personal Computer and compatible users to send and receive fax messages from their PCs. Microfax runs in the background, allowing PC users to run a word processing or spreadsheet program and communicate with a fax machine simultaneously, Esteverena said. It also will receive information automatically.

Microfax offers other features including store-and-forward memory for broadcasting, automatic dialing and a journal that keeps track of all communications. Users can transmit a page in approximately 30 sec. through a 9.6K bit/sec. modem. Also, a 1,200 bit/sec. Hayes Microcomputer Products, Inc.-compatible modem is included on the Microfax board for ASCII transmission. Installation will begin in December, with quantity shipments starting in March at $1,195.

The company also announced PC Image, an image scanning software package that runs under Microsoft Corp.'s Windows and supports many

See **DATACOPY** page 44

Bright outlook for Windows

From page 43

that Apple's Macintosh has been successful in establishing a strong beachhead in many organizations (even if it has not yet penetrated the heartland of most) has been its relative ease of use.

Efforts to put a similar interface on the IBM Personal Computer and compatibles generally began in 1984 after the Macintosh made the graphics interface of the earlier Apple Lisa affordable.

Not only Microsoft but also Visicorp (with Visi On) and Digital Research, Inc. (with its GEM, or Graphic Environment Manager) set out to develop some graphics interface products.

It turned out to be a much more difficult task than most expected. Visicorp was unable to stay in business as an independent company. Rights to Visi On were acquired by Control Data Corp., but it is no longer a significant factor.

Digital Research's GEM has achieved some success as a foundation for applications specifically requiring graphics, but recent difficulties at Digital Research have made it unlikely that GEM will be widely used outside niche applications.

> ***When Windows was introduced a year ago, Chairman Bill Gates made it clear that he did not expect instant success with the product.***

This leaves Windows by far the front runner for a graphics interface on the IBM Personal Computer and compatibles.

Microsoft, too, had its troubles at the beginning. The introduction of Windows was delayed several times.

Finally introduced at last year's Comdex/Fall, Windows demonstrated that it clearly required more horsepower than a standard Personal Computer or PC XT system, that was built around an Intel Corp. 8088, was capable of providing.

When Windows was introduced a year ago, Microsoft's co-founder and Chairman Bill Gates made it clear that he did not expect instant success with the product.

But he made it equally clear that the product was part of an important long-term strategy on Microsoft's part and predicted that it would ultimately succeed in establishing widely used standards. It looks more and more as if he was right on both counts.

Lower costs for IBM Enhanced Graphics Adapter (EGA)-compatible graphics boards and monitors, faster systems based upon the Intel 80286 and the recently introduced 386 microprocessors, even more capable

See **BRIGHT** page 48

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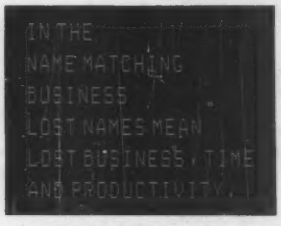

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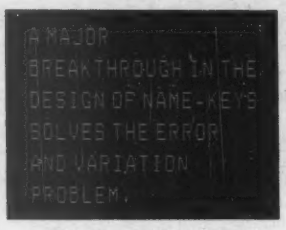

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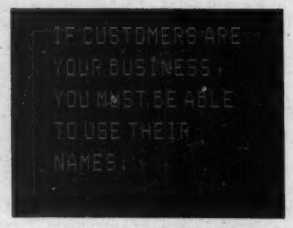

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Datacopy seeks to create standard

From page 43

popular desktop publishing packages. PC Image will be available in December for $495.

In addition, Datacopy's Word Image Processing System (WIPS) was enhanced to include support for other industry-standard file formats.

It will support Zsoft Corp.'s PC Paintbrush Version 3.0 files and Datacopy's .IMG file structure, allowing WIPS image files to be compatible with Aldus Corp.'s Pagemaker, Ventura Software, Inc.'s Ventura Publisher (marketed by Xerox Corp.) and Studio Software Corp.'s Front Page, according to the vendor.

The upgraded version of WIPS is available immediately to users at no extra charge.

Other enhancements

Datacopy also announced enhancements for its optical character recognition products, adding support for proportionally spaced fonts and variable-size characters. Also, an optional automatic document feed has been added to its Model 730 flatbed scanner.

Finally, Datacopy introduced two professional scanning systems for Apple Computer, Inc.'s Macintosh computer. Datacopy's Jetreader page feed scanner and Model 730 flatbed scanner, initially shown at the Seybold Desktop Publishing Seminar in September, were previously available only for the IBM PC and compatibles.

The two scanners can produce high-resolution images that can be used by most of the desktop publishing systems available for the Macintosh, including Aldus's Pagemaker, Manhattan Graphics Corp.'s Readysetgo and Boston Software Publishers, Inc.'s Macpublisher (recently purchased by Letraset USA).

Either system provides scan resolution of 300, 240, 200 or 150 dot/in. and can capture images of line art or pictures up to 8½ by 11 in.

The accompanying software for the Macintosh Plus is named Macimage.

The Jetreader system, with Macimage software and interface cables, sells for $2,255, and the Model 730 system sells for $3,255. Both will be available in December.

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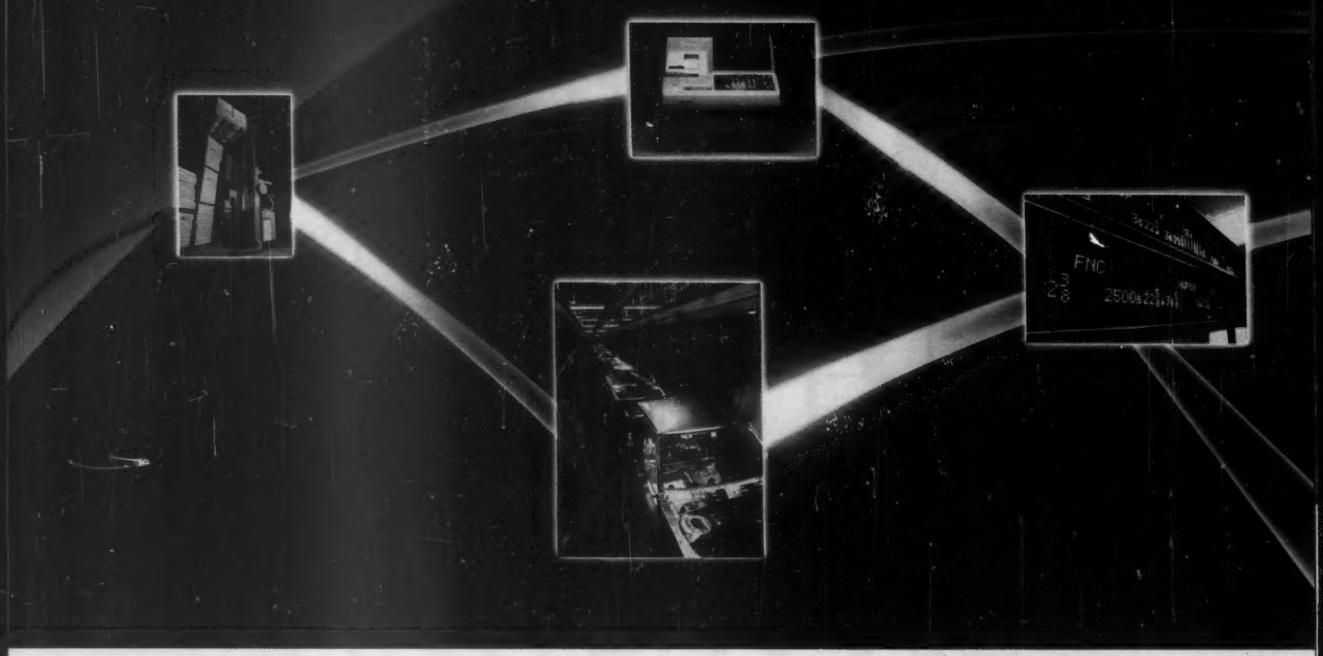

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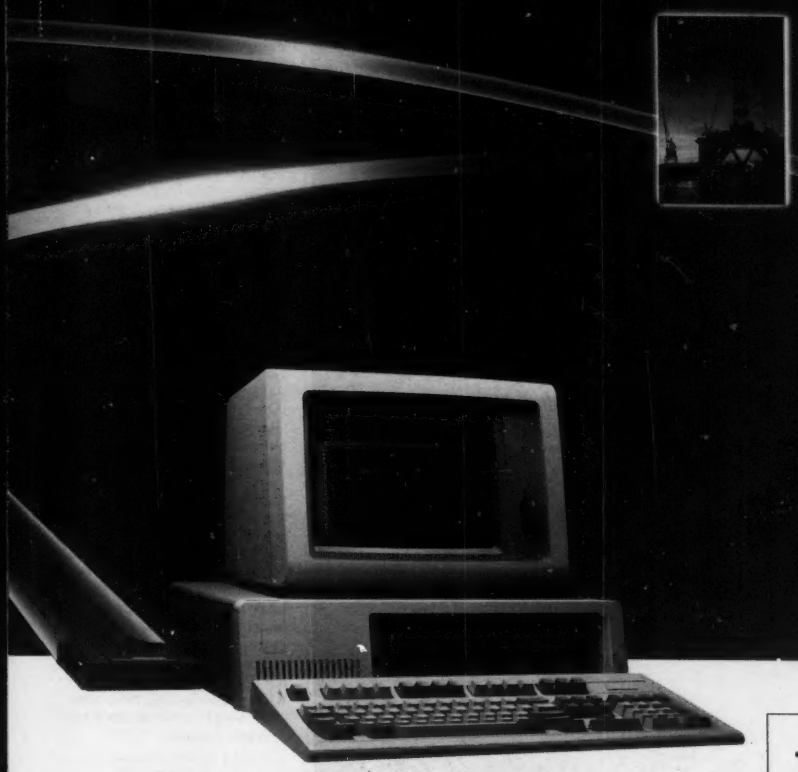

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Bright outlook for Windows

From page 44

graphics processors based on controller chips from Intel and Texas Instruments, Inc., lower costs for system memory and the hardware for IBM Personal Computers and compatibles is catching up with software like Windows. A growing list of software developers is supporting Windows.

The only potential obstacle to Windows' ultimate domination of the personal computer interface standard would be the introduction of a graphics-based version of Topview by IBM. While this cannot be ruled out entirely, the odds are against success for such an effort, despite IBM's enormous influence.

Historically, IBM has not been too successful with homegrown personal computer software. Sales of Topview, for example, have been negligible.

I would gladly put money on Windows as the winner, even if IBM entered the race. And I would not be the least bit surprised to ultimately see IBM endorse Windows instead of trying to reinvent the wheel just for the sake of creating something proprietary.

So the bottom line is that Windows, for $99, not only provides a handy and useful tool in its own right but also provides low-cost exposure to what will likely become the standard way of using IBM Personal Computers and compatibles by the early 1990s, if not sooner.

With a multitasking version of MS-DOS that supports the full address space of the Intel 286 due next year and with 386 versions not far behind, Windows will acquire multitasking capabilities behind the task-swapping abilities it already has.

More than just a graphics interface, the Windows package also comes with a basic word processing editor and a variety of quite handy desktop utilities. These include a calendar, a card file facility, a calculator and a variety of other goodies. (One of these, the game Reversi, is worth the price of the package and is hopelessly addicting, so be careful!)

A "clipboard" facility makes it possible to cut and paste between applications written for the Windows interface.

To really get full value out of Windows, you ought to have an EGA or compatible board and adapter, a 286 or faster processor and a mouse pointing device. Once you've used Windows on a system with these capabilities, however, you'll never again want to settle for less.

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Mac given Unix function

From page 43

Macnix can work on a distributed architecture of computers connected either by a local-area network or by an RS-232 or RS-422 serial line.

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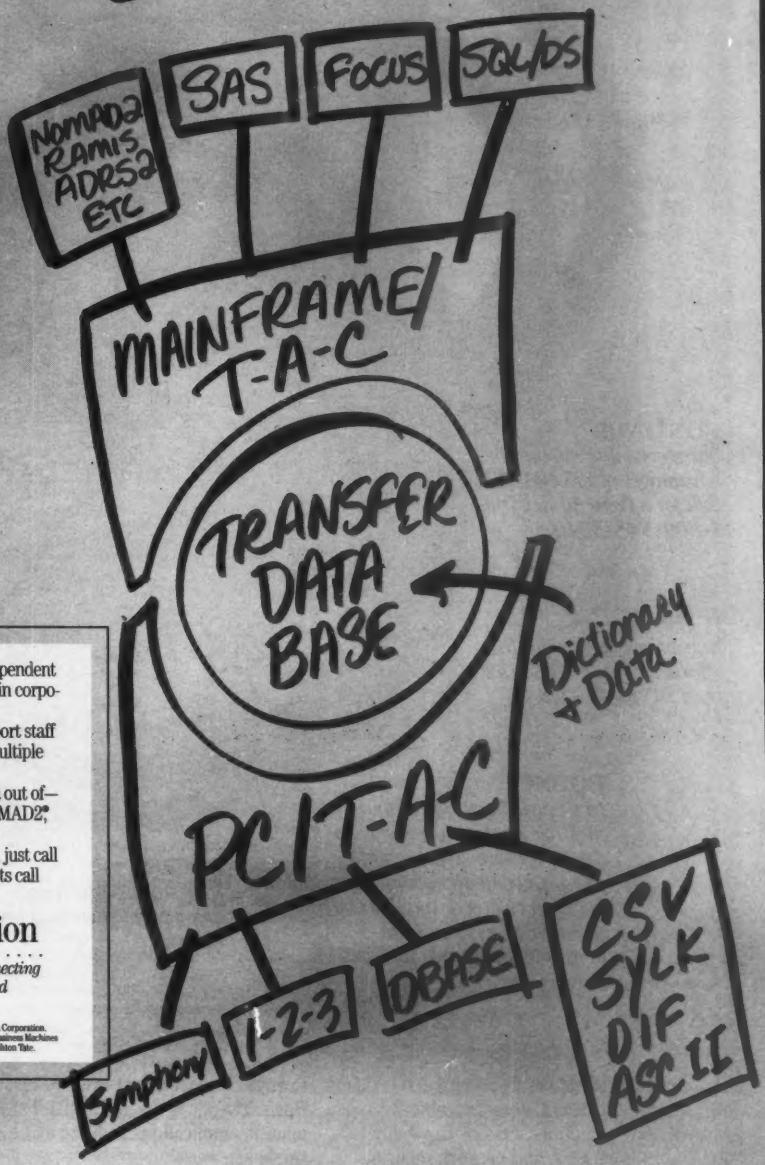

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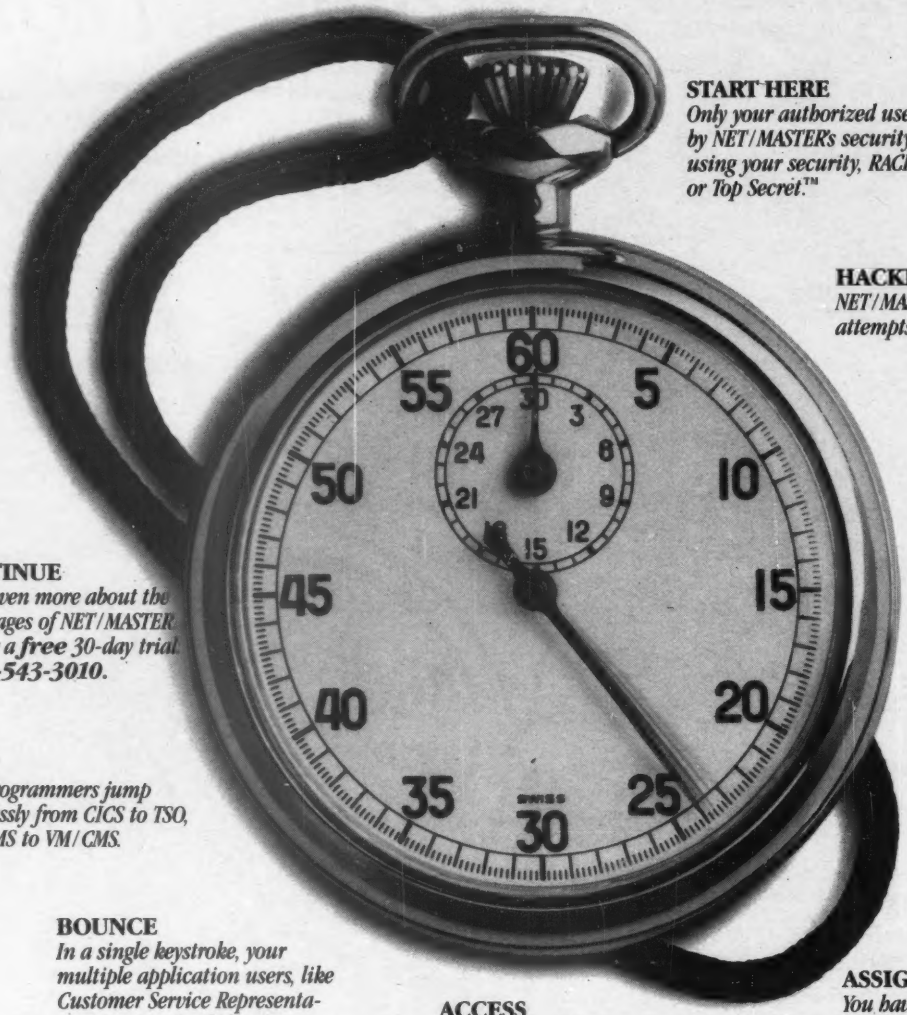

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Executive Report

Edited by Janet Fiderio and Kelly Shea

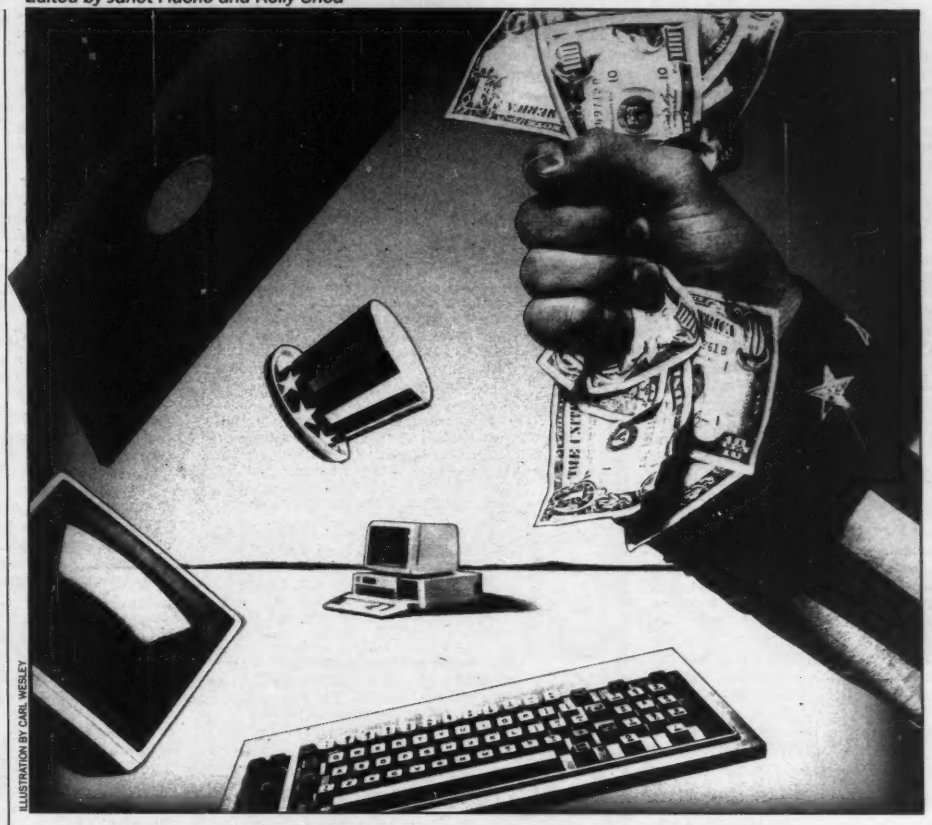


ILLUSTRATION BY CARL WESLEY

INSIDE

Expert Opinion: How a systems house can aid the overextended MIS manager/52

IBM's integration group cures health care provider's processing ills/56

Before you sign on the dotted line . . . Six vendor profiles/58

Systems Integrators

Strong in government, but what commercial role?

By JEFFREY TARTER

To Michael Szczygiel, specialized systems integrators have become the missing link between users and equipment suppliers. "There just aren't enough people out there who really understand how to put together sophisticated solutions," says Szczygiel, who is founder and president of Inforizon, a Princeton, N.J., consultancy with contracts in the government sector.

Scurrying to fill this need are a growing number of systems integrators — third-party firms that create information systems from a variety of hardware, software and communications equipment components. Unfettered by proprietary product lines, systems integrators freely choose from a variety of options to cure a client's MIS ills.

Systems integrators have made the biggest splash in government computing due to the latest round of federal contracting rules (see chart page 53). In fact, these third-party vendors are increasingly replacing the government's obsolete, incompatible systems with state-of-the-art solutions rivaling anything in private industry.

While the dollar value of many federal systems integration contracts is enormous, often multi-million dollar, what is impressive is more than just their size. Frequently, the systems involve unusually complex technologies that relatively few companies or MIS experts have fully mastered.

One reason these vendors have been so successful in the government sector and why they may be helpful in the commercial sector is that their contracts are not based on costs alone. Systems integrators do go through a rigorous bidding process, but contract administrators measure their performance by how well they provide a complete solution to an automation problem, not just by the prices they offer for piecemeal items.

As a result, these integrators tend to offer solutions that are more creative, flexible and sophisticated than those of traditional vendors. Clearly, there are lessons MIS can learn here from the experiences of federal contract managers.

One measure of the growing popularity of systems integration comes from Framingham, Mass.-

Systems integrators are replacing the government's obsolete, incompatible systems with state-of-the-art solutions rivaling anything in private industry.

Tarter, a free-lance computer industry writer, is also editor of "Softletter," a biweekly newsletter based in Cambridge, Mass., that reports on trends in the microcomputer software industry.

Do systems integrators have a commercial role?

Continued from previous page

based market research firm International Data Corp. (IDC). Consultant Nancy Ziedner at IDC's Washington Division estimates that government spending on systems integration in 1987 will be between $3 billion and $5 billion if federal agencies continue to consolidate their systems requirements and go with integrators. A 1985 IDC study states, "Three to five years ago, the consolidation of these service contracts, let alone their award to a team of providers, would have been revolutionary. Not so today."

Large hardware vendors are also aware of the value of systems integrators in handling complex projects. Rather than specifying their own proprietary components on all bids, some hardware vendors now actively help third-party systems integrators assemble hybrid systems. A few have even set up in-house systems integration subsidiaries — such as Burroughs Corp.'s Systems Development Corp. and the IBM Federal Systems Division's Complex Systems Organization — that will occasionally specify hardware and software from external sources.

Probably the most important skill government systems managers have had to learn is the new way of explaining their requirements to outside vendors.

In the past, agencies usually defined specific components for their systems — a certain number of terminals, so many megabytes of hard-disk capacity, software with a list of specific features and so forth. Now, a request for proposal (RFP) is more likely to define a general problem that the agency wants to solve. There may be a fairly detailed description of the problem and the requirements for a successful solution, but bidders are encouraged to propose whatever components and technologies they think will yield the most effective solution.

Don LeCrone is the project manager for the U.S. Patent and Trademark Office's huge Automated Patent System, being developed by Planning Research Corp. of McLean, Va. — an integrator recently acquired by Emhart Corp. of Farmington, Conn. LeCrone's project will result in an electronic data base of patent records that can be retrieved from optical disk storage devices and examined with special dual-screen workstations.

He points out that preparing RFPs for systems integrators may seem easy but that, in fact, government MIS managers still have to do a good deal of homework when they work with these firms. LeCrone says he and his colleagues spent months researching advanced data storage and retrieval technologies before trying to create specifications that would not limit the creativity of bidders.

"The hard part of writing the requirements was to take our preconceived notions out of the specifications and write a pure requirements statement."

One of these requirements, he adds, was for "a workstation that doesn't yet exist," to be used by patent examiners who need high-speed retrieval of diagrams from a data base comprising 27 million records, each page of which may be composed of up to 8.5 million bits of data. LeCrone says the integrator is expecting a workstation meeting those requirements from Gould, Inc.

Ultimately, the Patent Office provided bidders with 2,500 pages of documents as a guide for what the proposed system should be able to do. Much of this material consisted of discussions of the Patent Office's goals, not formal requirements. "We didn't intend to hold the vendor to these concepts, but we wanted to breathe life into the stale requirements," LeCrone says.

When systems integrators are given such open-ended specifications, evaluating bids becomes more difficult.

The bids for a relatively straightforward $7 million office automation project for the U.S. Department of Labor's Inspector General's Office took almost two years to evaluate, according to computer systems specialist Al Piercey in the Inspector General's Office. The RFP called for an integrated system composed of 15 minicomputers and a variety of printers, tape drives, terminals, modems, data switches, multiplexers and software.

"We weren't awarding any technical points," Piercey says. "It was all based on cost. But we first had to go through and make sure each proposal was technically acceptable. Then we had to go back to the vendors and ask a bunch of questions. After about three tries, we ended up with a list of vendors that technically met the requirements. Then the vendors each came in with a 'best and final' business proposal. It stuns you to have to live through that."

Piercey says systems integrators usually earn high marks for their understanding of the special business requirements of their customers. Most are specialists in a particular application area. "They tend to be smaller firms, and you tend to get more personalized attention," he adds.

But Piercey also points out that there has to be a good bridge between the customer and the systems integrator's in-house expertise. "You rely very heavily on the technical ability of their marketing guys," he says. "They're the ones who really have to have a good idea of how to put things together from many vendors."

Systems integrators agree that the key to success in most large projects is having good communication and knowledgeable project managers on both sides of the table.

Tony Cavello, Planning Research's project manager for the Patent Office's automated record keeping system, argues that a sense of team spirit is especially vital when projects are likley to stretch out over many years. "The customer and the integrator have to feel like they're on the same side," he says. "Once there's a solid feeling among the players, the rest of the job is easy."

SYSTEMS INTEGRATORS WIN BIG BUCKS IN THE FEDERAL MARKETPLACE

The U.S. Department of Agriculture last year awarded a $233 million, 10-year contract for office automation systems and services to Electronic Data Systems Corp., a subsidiary of General Motors Corp.

The National Aeronautics and Space Administration consolidated 16 service projects into a single $685 million contract, coordinated by Rockwell International Corp., Bendix Field Engineering Corp. and Burroughs Corp.'s Systems Development Corp.

The U.S. Department of Justice's Civil Division earlier this year awarded a $30 million OA project to Tisoft, Inc., a 5-year-old systems integrator that has become increasingly successful at winning federal contracts.

The Patent and Trademark Office is in the midst of a $445 million automation project that will extend until the year 2001. The system is being developed by Planning Research Corp., which was recently acquired by Emhart Corp.

The Internal Revenue Service has been working with Electronic Form Systems, a division of Computer Language Research, Inc., on a plan to switch its entire system of processing paper tax returns to a completely electronic one. IRS officials say they can't even estimate the ultimate cost of the changeover.

CW Chart

Integrators assume risks of complex system acquisition

By LYNN BATEMAN

Although MIS and hardware vendors initially questioned the viability of systems integrators, the tenacity of many of these now-profitable firms has paid off.

Companies including IBM, AT&T and Burroughs Corp. are incorporating systems integration techniques in their marketing and customer support, sending a clear message to the business community that there is a role for integrators in the information management business.

Expert's Opinion

So what are these firms doing right? The classic systems integrator has enough capital to finance a large computer acquisition and is also willing to accept the risks associated with complex hardware and/or service contracts.

One reason integrators currently flourish is that the perils associated with complex systems acquisition are greater than ever.

MIS managers often have a difficult time keeping up with changes in technology and so allow little time for a thorough analysis of the best approach to solving automation problems, which causes frustration.

In addition, avoiding the financial risks of hardware and software acquisition and obsolescence requires an expertise in corporate tax as well as in other areas, such as depreciation and resale, that few data processing managers have the time to acquire.

Systems integrators, therefore, as experts in planning, financing and acquiring as well as in implementing complex systems, fill an MIS need. By calling on an integrator to perform a thorough analysis of available hardware and software to meet corporate needs, MIS clients are then able to act as the business managers of their operations, which they are often called upon to be anyway.

Clients can use their time to examine the costs and benefits associated with new hardware; they are also able to evaluate the trade-offs that are always involved in capital expenditures vs. short- and long-term gains.

Another advantage the integrator brings is objectivity. An integrator is seldom involved in the internal struggles that are part of every organization's budget process and forecasting procedures.

Using a systems house allows corporate MIS executives to manage the process without suffering the associated headaches in areas that they may be too busy to devote adequate attention. ■

Bateman is president and publisher of Taurus® Program Services of Government Counselling Ltd., a consulting, publishing and procurement services firm based in Springfield, Va.

What complicates many of these projects is that they may take years to be fully implemented.

In the meantime, leading-edge technologies may become obsolete, vendors with far better solutions may emerge and suppliers of key components could go out of business or stop supporting products that are vital to the system.

Three years ago, the U.S. Department of Justice's Civil Division took a consultant's advice and replaced its dedicated word processors with clusters of minis and terminals.

Only two years later, however, OA technology had made such dramatic advances that the "new" system was perceived as a serious bottleneck to productivity. Currently, a newer and even more powerful system is being installed at a cost of at least $30 million.

'There just aren't enough people out there who understand how to put together sophisticated solutions.'

— Michael Szczygiel
Inforizon

How does a systems buyer avoid the risk of obsolescence? LeCrone argues that one technique is to "absolutely minimize interfacing problems." Although a systems integrator may be able to create links among all kinds of hardware and software components, he says, in the long run it is safer to build a system with as many standard elements as possible.

Consultant Szczygiel says it is also important to structure contracts with systems integrators so that the central core of functionality — such as the architecture of the data base or the choice of hardware — is likely to have the greatest longevity.

On the other hand, peripherals such as laser printers and software applications will probably undergo the most rapid evolution in the marketplace, he says, so users should be free to incorporate upgrades as soon as they become available.

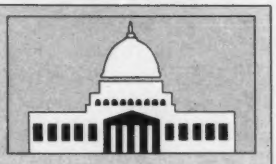
But it is not always easy to cope with the problems of technological change, federal project managers admit. Margarete Boudreau is project manager for a major systems integration effort under way at the U.S. Postal Service — a nationwide system of optical disk and electronic publishing systems designed to disseminate postal regulations. The prime contractor for the project, PA Computers and Telecommunications of Princeton, is acting as systems integrator.

According to Boudreau, "There's a lot of vaporware" that appears when contracts are put out for bid. "The bidders say, 'Tell us your requirements and we'll build it.' They can't

Continued on page 56

MITCHELL J. HAYES

LEGISLATION SPURS GOVERNMENT USE OF INTEGRATORS



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CW Chart

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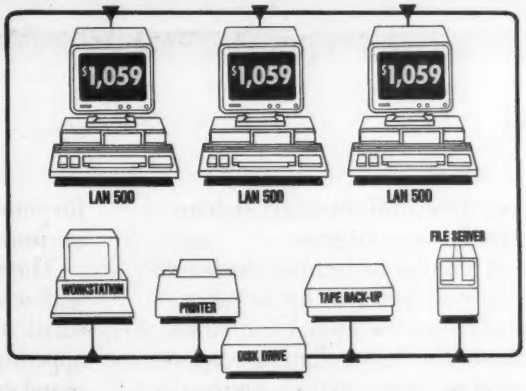

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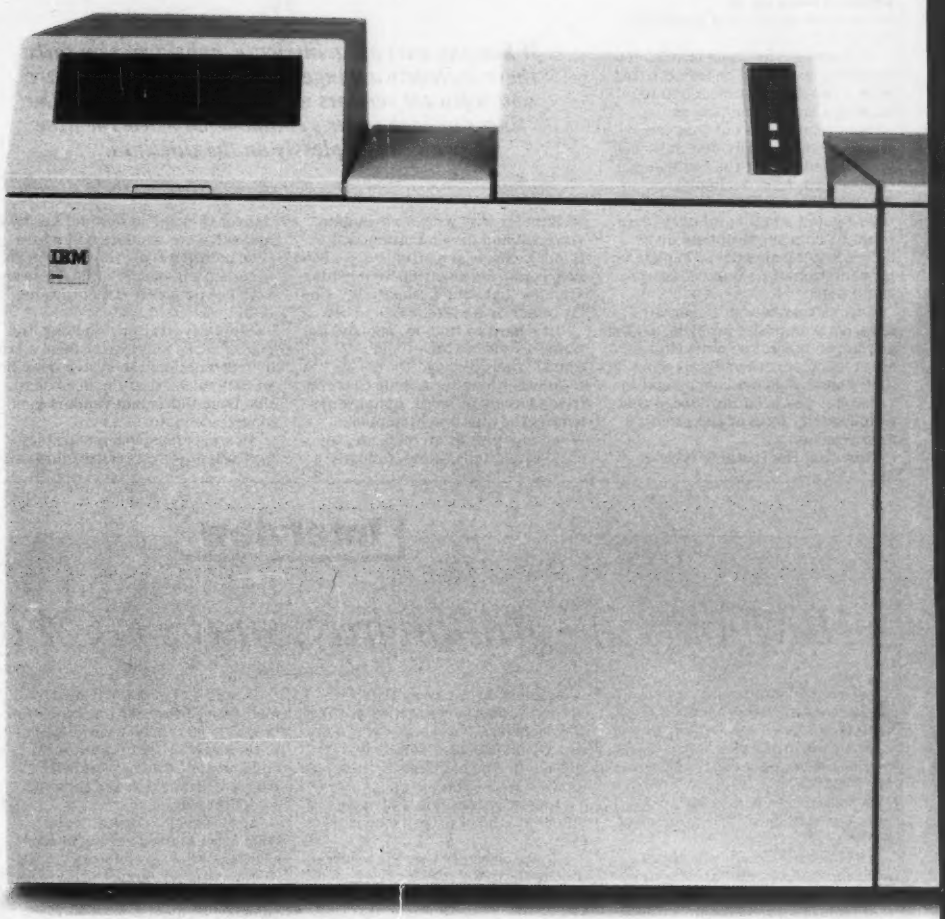

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Continued from page 53

always deliver on their promises, however."

If possible, she recommends, new technologies should be tested first with a small pilot project before making a major commitment.

Boudreau points out that the whole system usually does not need to be tested — just the components that involve risky technologies. Thus, the Postal Service carefully investigated whether all of its data could fit on a single optical disk before moving ahead on complete implementation of its publishing system design.

Just as frustrating, Boudreau says, is the opposite problem: asking a systems integrator to develop a new technology, then discovering that a much cheaper commercial solution has just been introduced that would satisfy most of the project's requirements.

Now that the Postal Service is well under way with its own data retrieval and dissemination system, Boudreau says she often reads about new corporate electronic publishing systems that sound remarkably similar to her own system.

"It's hard to find out about these things in time to take them into account," she says.

Another long-term issue that confronts buyers of large, complex systems is the question of support. When any part of an intricate, hybrid system fails, there is clearly a danger that the individual hardware and software vendors will waste time pointing their fingers at each other's components while the user watches helplessly from the sidelines.

Similarly, training and ongoing maintenance may suffer from a lack of coordination; the system may be so customized that the documentation from individual vendors is no longer adequate.

However, systems integrators typically offer centralized one-stop support for all parts of the systems they install, even though they may subcontract some responsibilities to outside training and support firms.

Henry Lahaie, a Justice Department attorney who has helped oversee the installation of a $30 million OA system for the Civil Division, says one-stop support from the systems integrator, Tisoft, Inc. of Fairfax, Va., has made the system work much more smoothly.

By the end of next year, the system will include 2,000 terminals and will link Justice Department branch offices throughout the country.

"We've got all kinds of printers and equipment made by different companies. If I or anyone else had to deal with all these people every time something went wrong, we'd go nuts. We just make one telephone call to Tisoft, and it's their responsibility to get it fixed," he says.

Moreover, according to Lahaie,

Continued on page 61

> ***When any part of an intricate, hybrid system fails, there is clearly a danger that individual hardware and software vendors will waste time pointing the finger at each other's components while the user watches helplessly on the sidelines.***

Interview

IBM joins integration fray, snags HCA as early client

Ever eager to capture a new market, IBM's Complex Systems Organization joined the fray of systems integrators seeking commercial sector contracts in December 1985. One of Complex Systems' first contracts was with the Nashville-based Hospital Corporation of America (HCA).

HCA is currently developing a nationwide administrative system and network for 479 of its affiliates. It expects to begin phasing in the network in late 1987 and early 1988.

Tom Dugger, assistant vice-president of information systems, recently spoke with Janet Fiderio, senior editor at Computerworld, *about HCA's decision to use a systems integrator. The Complex Systems Organization is a branch of IBM's Federal Systems Division based in Bethesda, Md.*

Systems integrators are most often seen in the government sector. Why did HCA choose to use one?

Basically, it was due to the scope of the project that we're undertaking. We have roughly 200 hospitals around the country that we own and approximately 200 more that we manage.

In this marketplace, where we provide care and manage patient information and try to deal with a multitude of physicians, hospitals, patients and payers — that is, insurance companies and other types of payers — one of the keys to managing is an effective information system.

In addressing that requirement, we realized that the processing capacity that we need, the systems functions and the kind of large data base management that it requires is a very extensive undertaking.

The project was too complex, then, to organize internally?

It was too complex to try to do completely on our own. We felt we needed additional expertise, both on the hardware and the software side, as well additional experience — somebody who had dealt in these kinds of issues before.

It wasn't appropriate to undertake that kind of project on our own.

We are also very new to the large processing mainframe-type of operation here at HCA.

How is that?

In spite of being a $5 billion company, all of our mainframe processing had always been done through General Electric Information Services Co. — time-sharing — all of our financial accounting and so forth.

In spite of being fairly new to mainframe processing, we were fairly well experienced with minicomputer and microcomputer processing and had done a lot of work with IBM, particularly on the personal computer side.

As we began to look at mainframes, we started getting interested in a lot of the technology that IBM had coming down the pike. And in trying to investigate those technologies, we came across the Complex Systems group. We developed an informal relationship that turned into something more formal as we progressed.

And you have a $25 million contract with them?

Approximately.

ILLUSTRATION BY KEVIN CONKLIN

HCA's Tom Dugger

> ***Systems integrators will become more prominent as people begin to get into larger data base applications with multiple-user sites.***

So we're in the process of converting all that to in-house. Just in the past two years have we owned our first mainframe.

What type of mainframe is it?

We have one IBM 3090, and we have three IBM 4381s.

How did you learn about IBM's systems integrator, Complex Systems Organization?

Did you consider any other integrators out there, like Electronic Data Systems Corp. or Burroughs Corp.'s Systems Development Corp.?

We did not give others extensive consideration — that is, we did not put the project up for bids. I won't say that we didn't think of other folks, but we consider IBM to be a technology partner with us right now, for a lot different reasons — one being that their system was in our conversion.

So it was a natural fit with IBM; we felt they were probably the only group that could bring the desired technology and expertise to what we, in particular, wanted to do.

How strong was IBM's bias toward its own equipment?

They do have a bias toward IBM equipment. I think that's obvious in this type of arrangement. We will have non-IBM equipment that interfaces to our network, but the primary processing equipment, the mainframe equipment, will be IBM for all intents and purposes.

Is your contract with IBM a full-service contract? Does it include everything from designing the network to the actual procurement to the installation and then the training?

It basically provides for design and development work. As a matter of fact, there's no hardware in the contract itself. It's all software development.

What type of projects are systems integrators most suited to in the commercial sector?

I think the systems integrator is going to become more and more prominent as people begin to get into larger and larger data base applications with multiple-user sites who access the data bases for different reasons and have different functions involved.

I think a large piece of what we're trying to do is predicated on the availability of certain technology — for example, what's the local-area network going to be two years from now, and who's going to set that standard? We felt the only company really capable of setting that standard was IBM.

Was that why you went with IBM as the integrator?

It was a big consideration. ■

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A guide to systems integrators and their market specialties

By LAWRENCE STEVENS

Systems integration vendors do not fit a uniform mold. So if you are in the market for one, bide your time, do a bit of research and contact the vendor's former clients before you sign on the dotted line. To help with your research, the following is a partial list of vendors that — based on revenue figures — are major players in this market along with the primary markets each firm addresses.

Vendor Profiles

Electronic Data Systems Corp. (EDS), based in Dallas, is a wholly owned subsidiary of General Motors Corp. and is the world's largest supplier of systems integration and facilities management services.

EDS serves a wide range of government installations, from small state and county agencies to large federal departments. In 1985, its largest government contract was a 10-year office automation project for the U.S. Department of Agriculture that was worth $223 million.

EDS also has a strong presence in U.S. financial institutions. It handles the systems integration for 3,200 credit unions representing 10 million members. And it provides these services for many of the larger insurance companies, including Aetna Casualty and Surety Co., Transamerica Occidental Life Insurance Co., National Life Insurance Co. and Medicaid organizations in 16 states.

EDS's international operations increased by 100% in 1985, largely because it assumed all of GM's information processing operations in 21 countries. But it also increased non-GM foreign operations by picking up contracts in financial, insurance and public transportation companies. In 1985, EDS won its first contract from a foreign government. Belgium's Flemish ministry of education signed a long-term agreement with the firm to upgrade and integrate computer systems in 4,600 schools.

Primarily because of its relationship with GM, the company's sales increased in 1985 by 264% to $3.45 billion, and the number of employees almost tripled to 40,000. Nine thousand of those came from GM. Almost half of EDS's revenue comes from GM projects, and more than half of its employees now work on GM projects.

Computer Sciences Corp. (CSC), based in El Segundo, Calif., provides systems integration services for both computer-based and communications systems.

CSC's business is threefold. The Systems Group develops custom-designed computer and communications systems and performs large-scale systems integration. The Industry Services Group provides information processing services to specific markets, and the Information Network Services Group provides data communications through the company's Infonet network.

CSC has been the software engineering subcontractor for the U.S. Navy's Agricultural, Ecological and Geographical Information System, or Aegis, air defense weapons project through 16 years of development and production. The company also holds a contract to develop a private data network for the U.S. Customs Service and the U.S. Department of the Treasury.

CSC was recently awarded a contract by the Federal Aviation Administration (FAA) and IBM to provide systems integration for 20 air-traffic control centers. It also recently won a contract to provide software development and hardware engineering for the Jet Propulsion Laboratory in Pasadena, Calif.

The company's fiscal 1986 revenue was about $838.6 million, and the firm is ranked 87th on *Fortune*'s "diversified-services companies 100." It is also the 65th largest defense contractor. It has 16,000 employees and serves such industries as consumer credit, health care, insurance and manufacturing.

System Development Corp. (SDC) is a subsidiary of Burroughs Corp., located in Detroit, that provides systems integration and maintenance services for government agencies. Its major clients include the National Aeronautics and Space Administration, Environmental Protection Agency, U.S. Department of Health and Human Services, Navy, FAA and U.S. Air Force.

SDC was recently awarded a contract to design, integrate, test and install a centralized air defense system for the Royal Thai Navy. The project, which was sold through the Electronic Systems Division of the U.S. Air Force, consists of a centralized command/control and communications network. Total value of the contract is $71 million.

SDC is also involved in an FAA program called Mode-Select, which is a radar tracking system. SDC is a joint prime contractor with Westinghouse Electric Corp. on the Mode-

Stevens is a free-lance computer industry writer based in Springfield, Mass.

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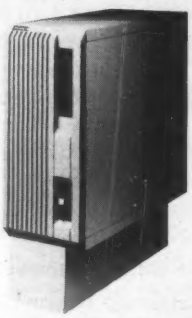

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Select project. SDC provides the DP subsystems and is designing a distributed microprocessor system. The value of that contract is $82 million.

The company is also the prime contractor for an integrated intelligence processing system for the U.S. Naval Intelligence Command. The contract, which is worth about $150 million, will include an IBM 3081-based ocean surveillance system, message processing, special-purpose subsystems and 24-hour maintenance for more than 55 Digital Equipment Corp. CPUs.

With 2,000 employees, SDC is a $650 million Burroughs subsidiary. Its role in the company will not change as a result of Burroughs' recent merger with Sperry Corp., but it will become one unit of a three-unit organization called Defense Systems Operations. The two other units will come from Sperry.

Planning Research Corp. (PRC) is a systems integrator based in McLean, Va. The company was recently acquired by Emhart Corp. of Farmington, Conn., and will continue as a separate unit of Emhart. PRC has four operating groups.

The Business Information Systems group provides services for commercial clients. Although its primary client base is real estate-related — it works with many multiple-listing service companies — it is aggressively branching out into other areas. For example, in 1985 it purchased Medic Computer Systems, Inc., which develops computerized systems for physicians in group practices.

The Engineering group focuses on industries such as hazardous waste management, transportation and large-scale land planning. Outside the U.S., it focuses on infrastructure projects funded by international institutions. The Government Information Systems Group works on high-technology projects for the U.S. government. System Services, the last PRC group, provides system support for various commercial and government projects.

In 1985, PRC won a number of large government contracts. The U.S. Navy awarded the company a $12.3 million contract to develop a data base management system designed to improve labor productivity, and U.S. Army Europe awarded the integrator a $4.5 million contract to develop a comprehensive intelligence handling system.

PRC had 1985 revenue of about $372.4 million. The company employs 5,500 people.

Grumman Corp., located in Bethpage, N.Y., specializes in government contract work. In 1985, its Data Systems Division expanded its systems integration business with the U.S. Department of Defense, NASA, federal and state agencies and a few private industries.

The division's systems integration activities focus on five market segments: command, control, communications and intelligence systems; computerized test systems; engineering and scientific systems; management information systems; and integrated manufacturing systems.

Among its more recent contracts was a $29 million award by the U.S. Air Force to upgrade the computer system at the Arnold Engineering Development Center in Tullahoma, Tenn. Rolls-Royce Ltd. of Bristol, England, also commissioned Grumman to develop the requirements for computerizing its aircraft engine test system.

Grumman was recently awarded a $50 million NASA contract to integrate, install and maintain the engineering, analysis and data system at the George C. Marshall Space Flight Center in Huntsville, Ala. Last year Grumman completed the welfare management system for the New York State Department of Social Services and a management system for the Jacob J. Javits Convention Center in New York.

Grumman is a $3.1 billion company; the Data Systems Division accounts for $245 million of the company's revenue. The division's 1985 revenue was up 25% compared with 1984 figures, mostly because of its expansion into systems integration. It is also ranked seventh among companies that provide third-party computer maintenance services.

SHL Systemhouse, Inc. is based in Ottawa, Ont. Among its larger 1985 contracts was a $1.8 million project to design and implement Los Angeles County's County Warrant System. The system will be operated by the county's Department of Data Processing and will be used by 50 law enforcement agencies to serve arrest warrants and temporary restraining orders and provide investigative and statistical information.

Last July, the company announced its receipt of a 10-year contract from the U.S. Navy to design, implement and maintain the Navy's Planning, Programming and Budgeting Systems. That contract, which is worth about $8.9 million during the first year, is the result of a two-year effort between SHL and DEC, the hardware supplier.

SHL, established in 1984, employs more than 1,000 people, and its fiscal 1986 revenue was $60 million, compared with $35 million in 1985. Much of the increase was the result of its purchase last May of Capital Systems, Inc., an Alexandria, Va.-based systems integration company. SHL's business is now totally systems integration. The only exception to this was a four-year period ending in 1984, when the company produced and marketed software packages. ■

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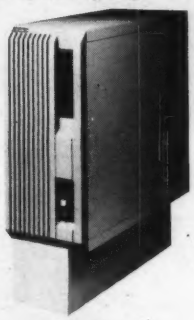

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Continued from page 56

the systems integrator's contract guarantees a four-hour turnaround on all trouble-shooting. "They've never missed a deadline," he notes.

As part of its package deal with Tisoft, the Justice Department also acquired a comprehensive training program — an important issue because of the complexity of the software that runs on the department's computers.

Attorneys and secretaries have access to a series of word processing programs, two data base managers, a graphics package, a project manager and a long list of on-line information services.

Some of these programs were provided by the primary hardware vendor, Data General Corp.; others, though, came from smaller software firms, such as Wordperfect Corp.

> ***Because bids are so complicated and more difficult to prepare, systems integrators tend to look for new business only in fairly narrow technological and applications niches, and even the most lucrative RFPs seem to attract fewer bidders than before.***

Lahaie says that the integrator's training subcontractor has put together courses for both secretaries and attorneys that take an integrated view of the system. Equally important, the training is customized for the Justice Department's specific research and document processing needs.

"Attorneys don't need to waste time learning about formatting multiple columns or setting up math functions," Lahaie explains.

Finally, he says, Tisoft considerably simplified the Justice Department's financial relationships with individual suppliers — an important issue in government contracting that often matters to buyers in the private sector as well.

By negotiating a single contract with the systems integrator, for example, the Justice Department was able to arrange a comprehensive lease-purchase plan that covers all components of the system, including software.

At the same time, the contract spells out maintenance charges for each individual piece of equipment. For this reason, costs are easy to compute as the system expands, and the Justice Department does not pay for overlapping contracts.

Not surprisingly, systems integrators do not often start with a clean slate when they install hardware and software components. Often, there are systems already in place that may not be ideal for certain applications.

At the Postal Service, one requirement for the electronic publishing system was compatibility with an existing Cullinet Software, Inc. IDMS software data base.

"No one had ever used a data base like that for a lot of text processing," according to Boudreau. "The programmers ended up doing things that even they were surprised they could do," she adds.

In the case of an ambitious electronic forms system that the Internal Revenue Service is installing, the integrator — Electronic Form Systems (EFS), a division of Computer Language Research, Inc. of Carrollton, Texas — faced an even more complex problem.

What the IRS wanted was the ability to transfer data supplied electronically by tax preparation firms to the IRS's regional and national mainframe computers and from there it wanted to merge the data into electronic forms.

The automated system had to tie in closely with the IRS's highly complex manual processing procedures and to mesh with other IRS long-range automation plans, some of which also embodied leading-edge technologies.

In addition, the IRS insisted on keeping secret some of the inner workings of its existing procedures, such as which items of data from tax returns are actually transcribed into the IRS

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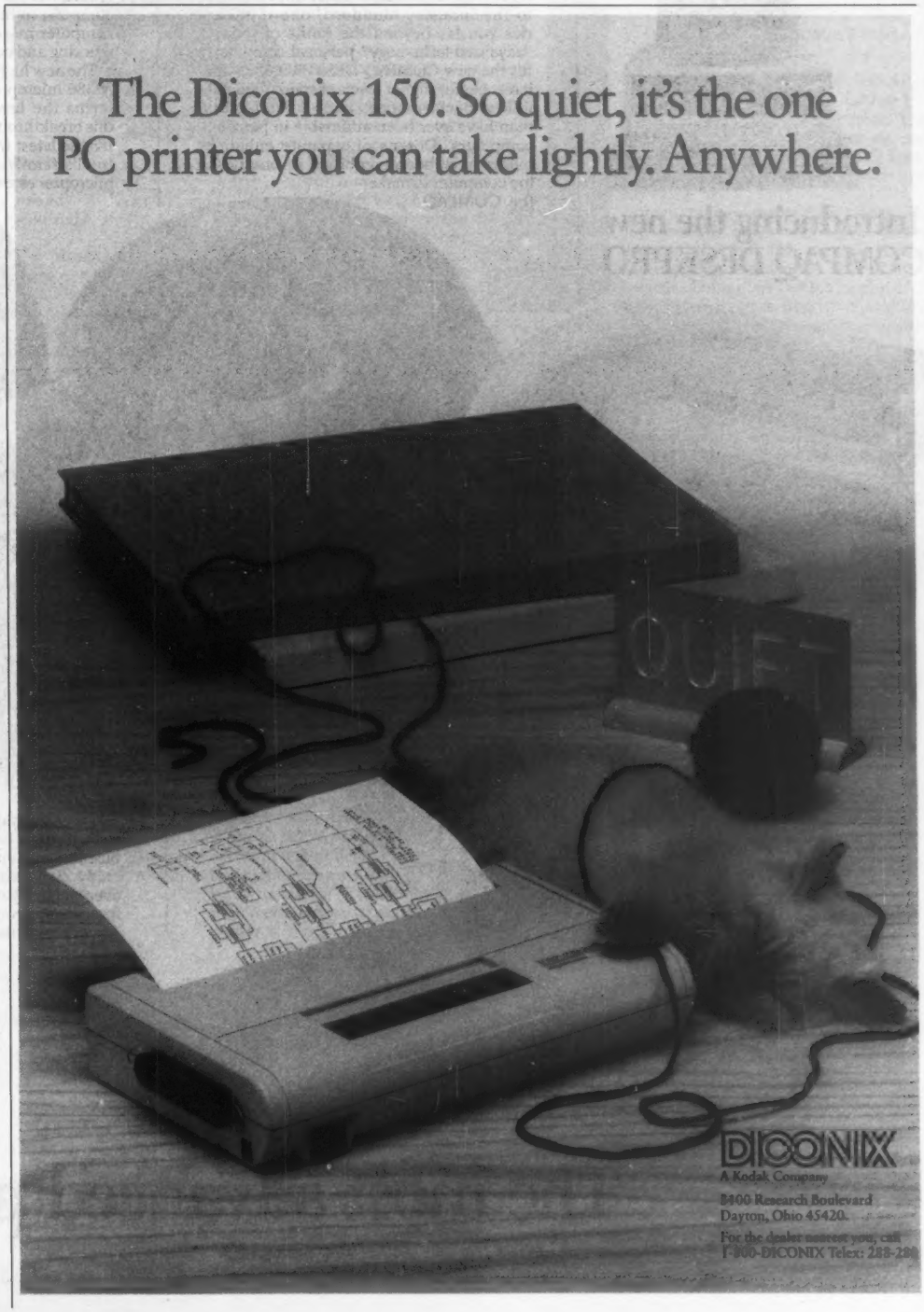
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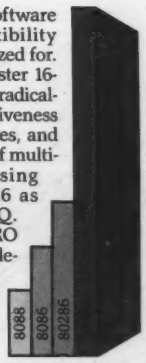

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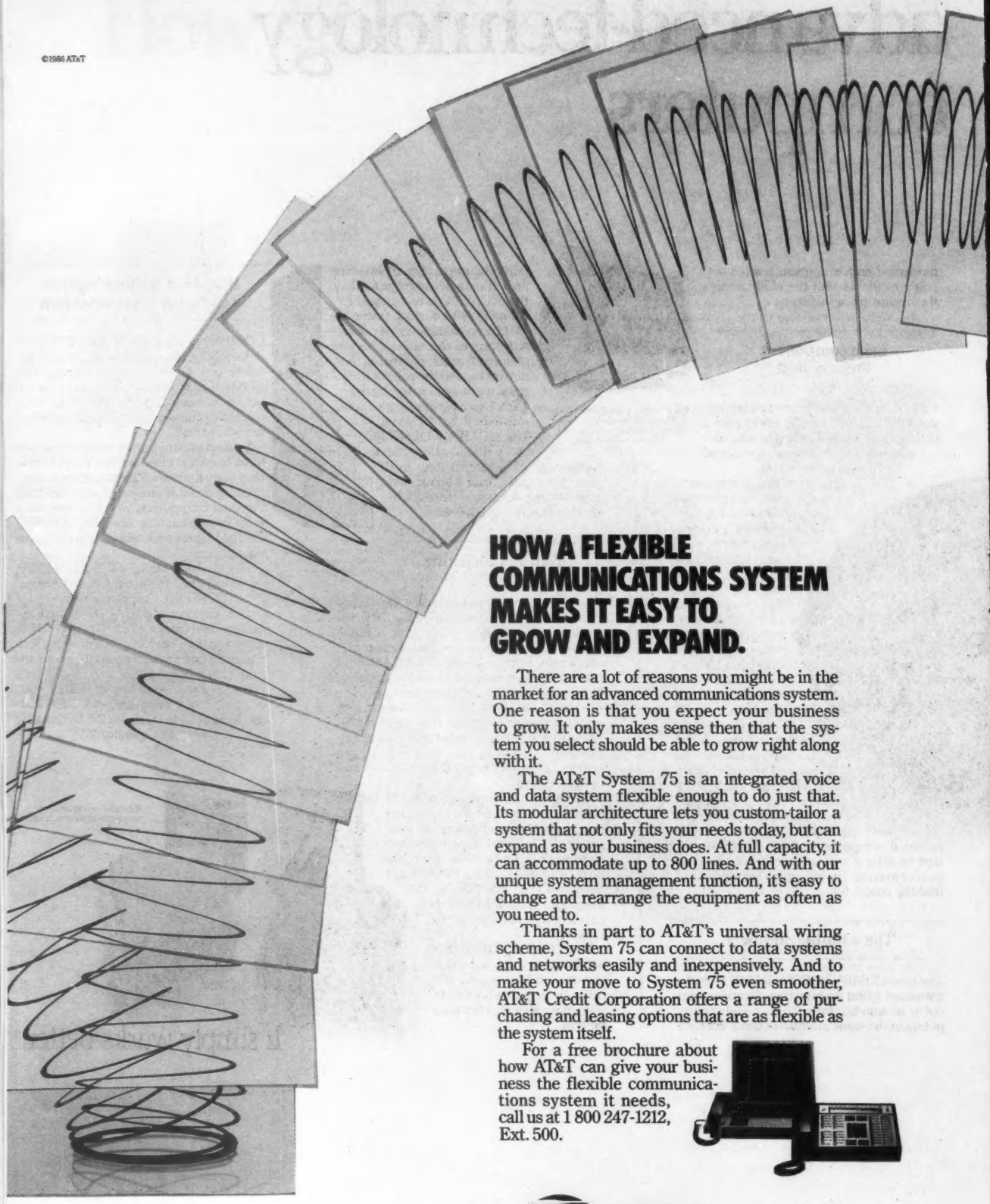

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Continued from page 61

data base.

In fact, says Carolyn Buttolph, program manager for the IRS's Electronic Filing Office, a major goal of the whole project was to make an almost invisible transition from manual to computerized procedures.

EFS was brought in, she says, because the firm had the graphics technology to duplicate on a computer screen the paper forms that the IRS now uses. "None of our people want to deal with a return that's printed on computer paper," she says. "They want to see a return that looks like a paper return."

Buttolph says the only practical way to deal with these constraints was for the IRS and the systems integrator to move very gradually toward full implementation of the IRS's goal — 100% electronic filing of all returns.

A year and a half ago, her office contracted for a small research test that cost less than $50,000 for hardware and software.

This year, the test was expanded; the system handled about 25,000 returns that were filed electronically from seven sites.

"In 1988, we're planning to move to full-scale use," she says; the IRS will also begin to accept additional kinds of electronic forms, such as partnership and fiduciary returns. Moreover, the electronic filing system remains relatively isolated from the mainstream of IRS operations.

Data from electronic sources is merged with manually encoded records at only one point in the system, although Buttolph says that "as electronic filing builds up in volume, there will be more hooks to other parts of the system."

Eventually, she explains, the IRS plans to make a complete transition — from handling paper returns to almost pure electronic processing combined with optical disk storage. "So far, it's going very smoothly."

Although systems integrators have clearly simplified many of the problems of managing large, complex projects and leading-edge technologies, federal contract managers are still unclear about one key issue: the potential for cost savings.

Because bids are so complicated and more difficult to prepare, systems integrators tend to look for new business only in fairly narrow technological and applications niches, and even the most lucrative RFPs seem to attract fewer bidders than before.

For example, LeCrone says the Patent Office only attracted two companies that were interested in its $445 million automation contract. "I'm sure if we'd done it piecemeal, we'd have had more bidders," he says. "But the burden of integration would have fallen on us."

However, other federal buyers insist that systems integrators often compare favorably even when they bid against larger hardware vendors, in part because they can assemble systems that incorporate components from cheaper sources.

Piercey says that the Labor Department's $7 million OA system contract was awarded to a systems integrator in an open competition that attracted many of the leading minicomputer vendors.

Szczygiel points out that systems integrators generally do best when the project involves more than just assembling components bought from larger hardware vendors. "Integrators will usually mark up the cost of the basic building blocks of the system 25% to 50%," he says.

'The hard part was to take our preconceived notions out and write a pure requirements statement.'

— Don LeCrone
U.S. Patent and Trademark Office

"Where they add value is through the software that ties it all together and the project management, which is quite demanding," he adds.

Szczygiel also points out that systems integrators often function as a big brother to very small, highly specialized subcontractors that may deal with customized programming, training and development tasks.

"Quite often, federal agencies find it easier to deal with a tried-and-true large systems integrator" that takes responsibility for the performance of all subcontractors, he says.

Still, he points out that even the larger systems integrators are often relatively new companies whose long-term viability is not necessarily guaranteed.

"There are a lot of one-contract companies here," Szczygiel says. "Even though a company has developed a lot of technology and knows your business, it's always worth remembering that they may not survive." ■

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In Depth

Stone Age programming cripples 4GL environment

Overengineering may be the largest cause of system failures • Object of technology: simplicity • Best way to design applications often found in methods used before the task was automated

By DANIEL NOLAN

Programmers lack the information to make the transition from second-generation, machine-driven design techniques to the new relational data base management systems and fourth-generation languages.

Relational DBMS technology allows programmers to establish their own criteria in setting up a system. Fourth-generation language-based DBMSs offer more flexibility than their second-generation, nonrelational counterparts.

The newer systems are more responsive to business requirements, allowing users to focus on business issues rather than on technical ones. Redundant coding has been removed almost entirely, with a corresponding reduction in errors.

Perhaps most important, today's DBMSs are applications-driven, not machine-driven. Relational DBMS design is no longer tied to the requirements of a specific machine but rather to the rules of the application for which the system is written.

However, the programmers, because of their past use of older, machine-driven design parameters, are inclined to favor these techniques over the newer ones. This complacency exacts a high penalty in terms of cost and risk of failure.

As the driver of a horse had to learn to manage the automobile, relational DBMS technology requires skills other than how to wield an equivalent of the buggy whip. Progammers now need skills that allow them to go directly into the application rather than fit the application to the machine.

Because they are new, these skills are not taught formally but instead are emerging through direct experience in the construction of application systems with the new disciplines.

File design is a critical area in which these needs are manifested. A number of situations arise when a fourth-generation data base management system is flailed with second-generation techniques, such as the following:

- Field names are prefixed by file names — a second-generation technique.
- Business applications may contain complex unpacked numeric data — an indication of second-generation reversion.
- Data compression may be overridden in a DBMS.
- "Filler" fields, which are not required in fourth-generation implementations, may be used.
- DBMS fields may be nondiscrete.
- Super- and subdescriptors with DBMS systems are prematurely defined.
- DBMS file descriptions are given as mirror images of existing file layouts.

At last: Independent descriptions

One of the most dramatic third-generation innovations to take place with Cobol during the late 1960s was file qualification. Prior to this, each field name in a program had to be unique. The examples provided by vendors showed fields uniquely identified with a prefix indicating the file of origin; an invoicing program, for example, might include the following:

INVOICE-VENDOR-ID
PAYMENT-VENDOR-ID.

Qualification permitted the file description to be independent of the data. With separate qualification, a program could refer to VENDOR-ID IN INVOICE-FILE and VENDOR-ID IN PAYMENT-FILE.

The result was much more aesthetic and logical: MOVE INVOICE-VENDOR-ID TO PAYMENT-VENDOR-ID became MOVE VENDOR-ID OF INVOICE-FILE TO VENDOR-ID IN PAYMENT-FILE.

More important, the third-generation CORRESPONDING option could be brought into play:

MOVE CORRESPONDING INVOICE-FILE TO PAYMENT-FILE.

Interestingly, CORRESPONDING was not used as frequently as was intended. In fact, resistance accumulated to the point at which some companies banned its use altogether.

When a file design is correct, use of the CORRESPONDING feature produces more

ILLUSTRATION BY JON MCINTOSH

About the author
Nolan is an Annandale, Va.-based computer scientist working with SHL Systemhouse of Canada, a systems integrator. He specializes in DBMS and fourth-generation languages.

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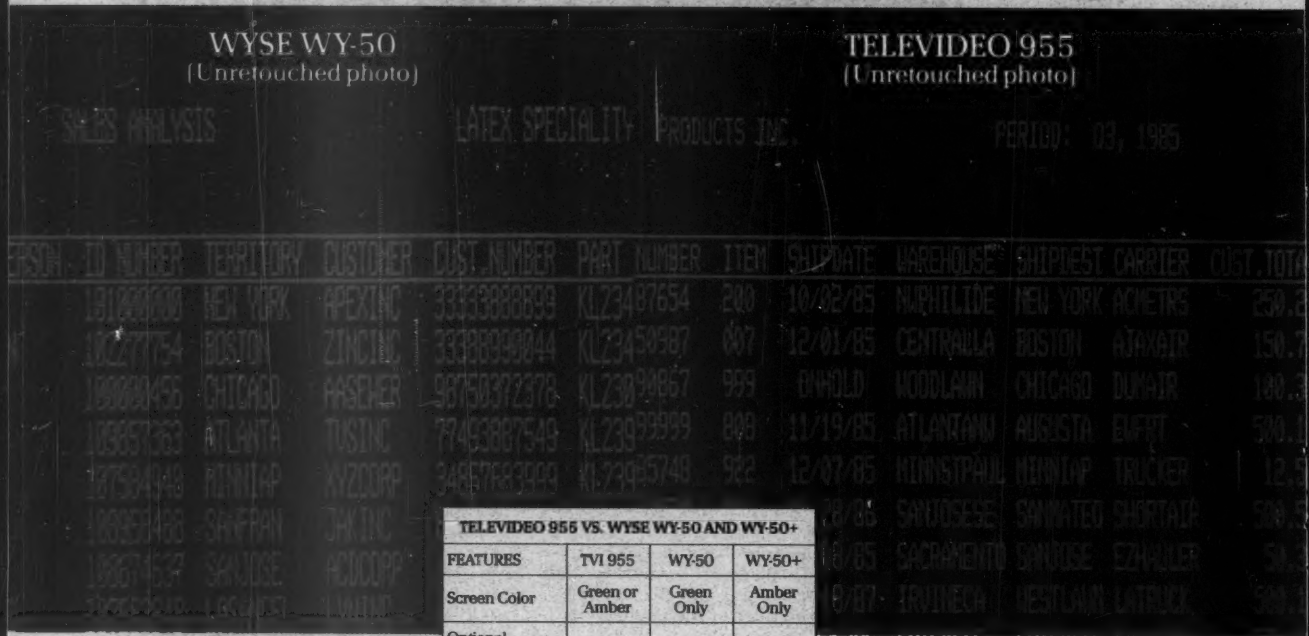

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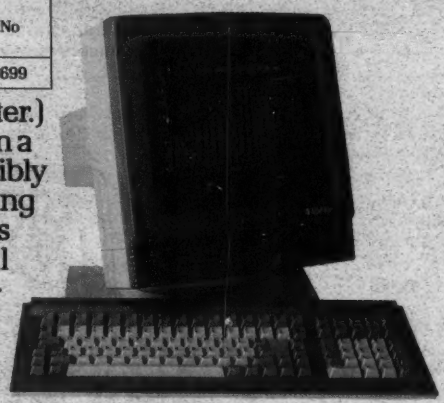

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meaningful code — a situation that began in the third generation and carried over to the fourth. However, its real value is seen when file design has been less than correct. This advantage usually emerges with the process of discovery that occurs when systems are first shown to the customer.

Programmers work fervently in an effort to demonstrate to the customer as finished a product as possible. When introduced to the system, the client will inevitably request a feature that was overlooked during construction, such as, "Some of our invoices have more than one payment, while some payments are only partial payments or are spread over several invoices."

This example is typical of all new systems in that it was set up with an incomplete premise or without benefit of a crystal ball. Most likely, the designers asked and were repeatedly assured that a single invoice would result in a single payment.

Similarly, had the system been built for a shoe store, the designers would have discovered that some shoes come in different sizes for right and left feet. This information undoubtedly would have been delivered — after most of the programs were written — by a loud voice during a demonstration for senior management.

A wrong system is a wrong system

This brings to mind an Abraham Lincoln story. "If I say a tail is a leg, how many legs has an ass?" he would ask. Receiving the customary answer, "Five," Lincoln would respond, "No, an ass has four legs no matter what I say." The lesson learned is that it does not matter what you were told — a wrong system is a wrong system.

On examination, the payment programs are found not to use invoices, while invoicing never references payments. As long as these tasks are discrete, the application will not have to be rewritten. All that needs to be done is for the single file to be physically separated into the two logical files — Invoices and Payments — that are already implicit. When the application programs are recompiled, each of them will already refer to the appropriately named file.

The most frequently encountered file name prefixing problem occurs when processing has to be changed in flexibility from one-to-one to one-to-many, many-to-one and probably many-to-many.

Using second-generation techniques, this means the number of changes required for rebuilding the applications is sufficiently large that everything must be rewritten. If a fourth-generation DBMS is used with fourth-generation techniques, the power of fourth-generation tools allows the entire issue to be handled in a single afternoon.

Not prefixing field names allows further advantages. The modern relational DBMS will supply field names by default as headings on reports. When the names are based on interviews with the people who will be using the system, reports can be made easily.

For example, if a client uses the term "unit" to describe a single quantity, he will write in his specifications that he wants to see the total units. By using unit as the equivalent of "quantity" in his system, much time can be saved and coding effort simplified.

> ***Programmers work fervently in an effort to demonstrate to the customer as finished a product as possible. When introduced to the system, the client will inevitably request a feature that was overlooked during construction, such as, "Some of our invoices have more than one payment, while some payments are only partial payments or are spread over several invoices."***

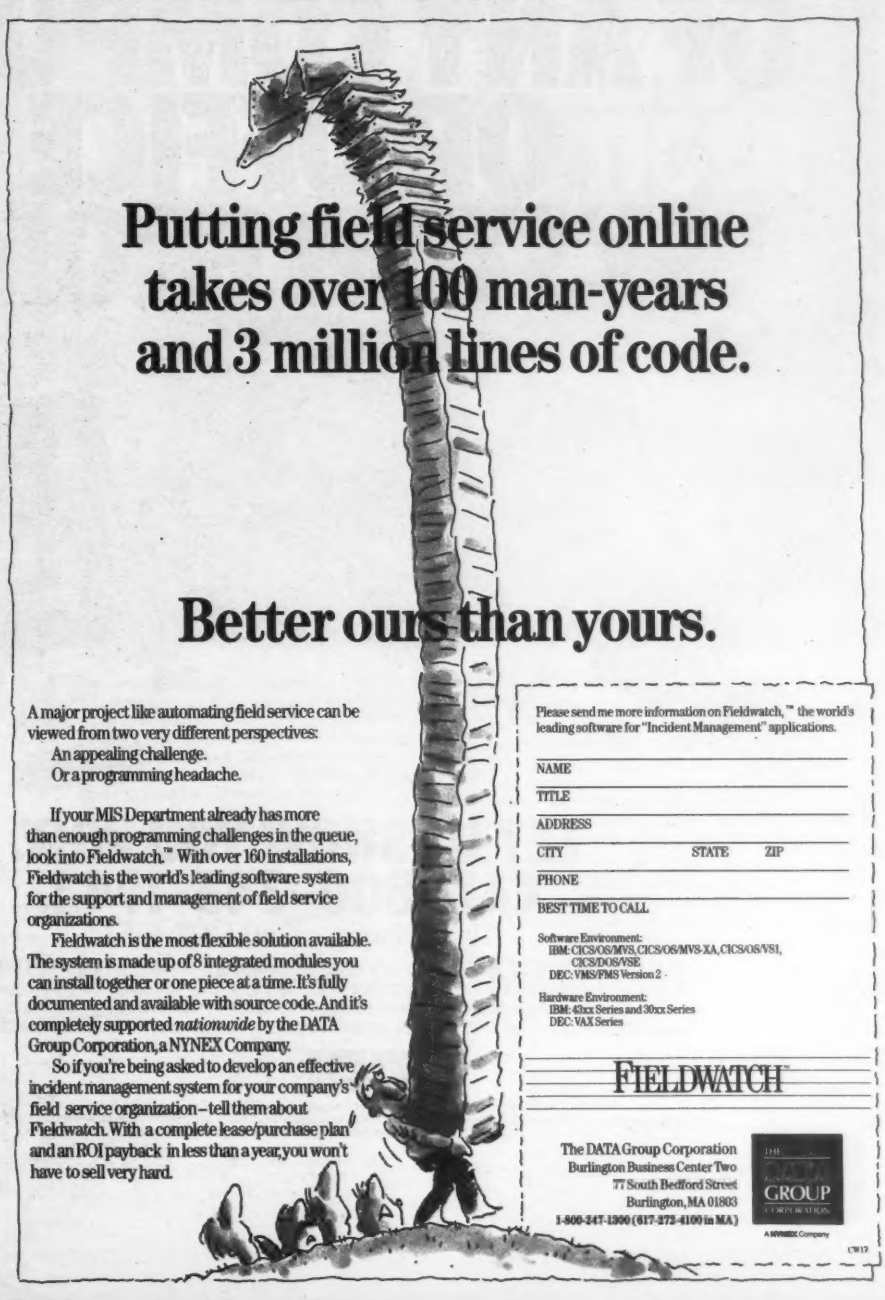
Whenever default headings must be overridden, one of the major advantages of a DBMS has been lost. A single definition for each field is no longer provided in the DBMS; instead, each field is essentially defined by every program that uses it. Field names should reflect contents, rather than source, disposition or any other attribute.

Business information consists of combinations of the characters A through Z, spaces, a few symbols (@,#,$,%,& and so on) and the numbers 0 through 9. Data is either a number, or it is not. A field will be either numeric or alphanumeric.

Canceling DBMS features

Defining the field further than the basic alphabetic or numeric turns off any automatic features for the DBMS and the fourth-generation language. Programs will be slower, and space will be wasted. The possibility of error is introduced, and the burden for performance is placed on the programmers.

Modern computer languages have been developed with the benefit of experience and automatically make the best use of space and time. When data types are defined as either alphanumeric or purely numeric, the DBMS will check all data to make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sure each field is valid and will determine the best method to store the contents.

In a modern DBMS, each field will be managed to conserve space. Typically, trailing blanks are dropped from alphabetic fields, numeric fields are packed and leading zeroes are removed.

This compression can be overridden. It can be turned off by defining fields as fixed lengths. "Compress-to-null" can be specified at the data definition level to compress empty fields into a single character in much the same way that characters are compressed.

In determining whether to override compression, during data definition the following questions must be asked — not only of the DBMS and the file but also of the data that will be stored:

- Will each record always maintain data in the field? Will the data in the field always be the same length? Is the field so short that keeping track of the length is more trouble than it is worth? If so, fixing the length is an option.
- Will the field be empty (blank or zero) for each record? Is it in a group of fields that will also be empty? If so, compress-to-null is an option.
- Is the field a key for which records having zeroes and blanks will be sought after? If so, compress-to-null may not be an option.
- Will all requests want to exclude records with this field empty? Compress-to-null may again be an option.

> ***With the philosophy of ever-present change, the number of redefinitions should be as low as possible, and the incidence of a field being redefined by all programs using it should cease to exist entirely.***

Compression assessment is best made after the bulk of the system has been developed and the contents of the files can be examined. Initial application of overrides depends on assumptions that may not be accurate. In addition, the compress-to-null feature may impede early programming by making key data difficult to access.

Few files that have had proper criteria applied will result in all fields being overridden. Since overrides can be swiftly and accurately applied against actual data, overriding at the outset affords little advantage.

Filler fields

In non-DBMS applications, each field is defined in the order it occurs and will occupy a set amount of space in a record. Since this determines the length of each record, adding a field requires converting all the files from one length to another. Where adding a field required a major effort, the process of inserting a new field between two others was so involved that it was impractical.

In self-defense, developers would provide at the outset a certain amount of unused space that could be defined without converting the files as the need arose later in the project.

In the fourth-generation DBMS, fields are identified separately. The fields and the order in which they are stored is determined independently of their use in the application programs.

Thus, fields can be inserted as required without affecting prior applications. These applications, because they were built beforehand, will have no reference to the new fields. Specifying contingencies in a DBMS is neither necessary nor justified. Doing so will only serve to increase overhead and cause logistical problems.

Fields, key or otherwise, contain several meanings that would be better served by establishing individual fields for each meaning. Identification fields should consist only of those values relating to identification.

Discrete fields

The temptation to have an identification allude to location, order or other possessives must be resisted. Fields can be provided for these attributes, and the benefits will far outweigh whatever motivated the inclination to combine information.

In the early computer systems, combining fields was necessary (see chart page 72). None of the schemes held together over time. An example would be the field VENDOR-ID.

If VENDOR-ID is further defined as region, department and office while remaining a single field, both its meaning and its basic flexibility are compromised.

This further identification was necessary with primitive systems that permitted only a single index key. Single fields would be broken down into their component parts by each program. The confusion resulting from this redefinition was considered to be part of the cost of programming.

Fourth-generation DBMSs allow the definition of any number of fields. However, programmers continue to combine fields. As the following examples indicate, fourth-generation software will not by itself prevent this second-generation practice.

Redefinition. In the chart examples that show combined fields, individual data can be extracted only by redefining a field. Controlling redefinitions in each of a series of

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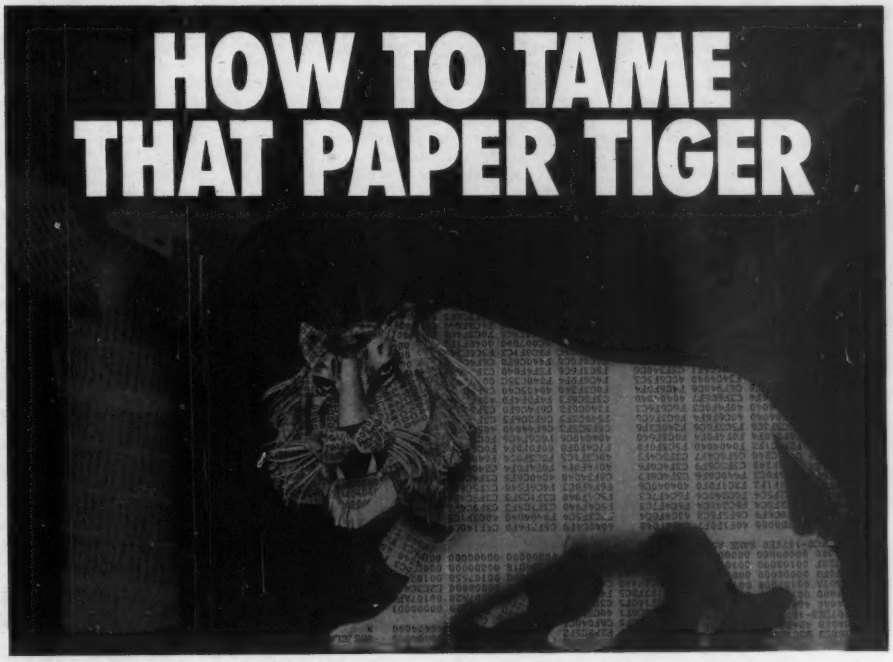

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programs is a logistical problem that can only be partly aided by standards and utilities. Field definitions could be changed in any program, at any time, by anybody.

As an effectively designed system carries few redefinitions, they can be considered an afterthought.

With the philosophy of ever-present change, the number of redefinitions should be as low as possible, and the incidence of a field being redefined by all programs using it should cease to exist entirely.

> ***Defining separate fields for elements will always be more straightforward and logical than combining those elements.***

Field length. Relational DBMS fields have no length. Whatever has been assigned as default can be changed at any time. Redefinition establishes a length and effectively freezes out this flexibility, which is so critical to protecting a software investment.

Changes. As a business changes, its applications and data tend to change. Where a single digit may be satisfactory for a firm with fewer than nine locations, the sudden addition of a tenth will disrupt every program in the system.

A data base management system is inherently able to allow data to be defined without constraints imposed upon it by usage. Defining separate fields for elements will always be more straightforward and logical than combining those elements.

Comparing relative costs of keeping a file shows that there is no advantage to combining fields if it can be avoided.

Even the merest hint at the existence of an individual entity is sufficient justification for its having its own field. Any combinations of fields can be separately defined with such DBMS facilities as superdescriptors and subdescriptors.

Data base systems consist of keys and data. Keys are identified and inverted in an index. Programs access data directly by referring to the keys, which are constructed automatically at the time each record is updated.

Records can be processed without having to depend on key fields. If this is the case, since all records in the entire file must be examined, considerably more resources are used than is the case in which keys can be used.

While keys do not have to be stored as data, more effort will be required to process and maintain those fields that exist only as descriptors.

Since keys are designed for access and data for processing, the work necessary to process keys is prohibitively more than is required for data.

Ideally, the values for each key will also be stored as data. Occasionally, however, there will be an advantage in constructing a key out of several fields or out of parts of a field.

There is no penalty for defining each seemingly worthy field as a key, if only to ease the job of programming. Later examination of code for use and subsequent elimination of unused descriptors will streamline the system dramatically.

Similarly, accesses can be done during development using nonkey fields, and the keys can be inverted at any time the overhead is justified.

Penalties occur only when such temporary structures, such as unused keys and nonkey reads, remain in place on production systems.

Allocating time and money at the outset of a project to examine the code and remove or add keys will protect against this.

At the same time, the code will show where fields that are consistently used together can be combined into super- or subdescriptors for added performance. Defining these structures can only be justified at this time.

Premature oversophistication carries an extreme penalty. In those

How not to program

Four examples show a single operation — redefinition — as coded in different programming environments. The last example shows an old technique carried over into a state-of-the-art development system.

Example of second-generation redefinition:

```
01 VENDOR-ID          PIC X (10)
01 FILLER             REDEFINES VENDOR-ID
   02 REGION          PIC X (5)
   02 DEPARTMENT      PIC 9 (3)
   02 OFFICE          PIC 9 (2)
```

Example of third-generation redefinition:

```
01 VENDOR-ID
   02 REGION          PIC X (5)
   02 DEPARTMENT      PIC 9 (3)
   02 OFFICE          PIC 9 (2)
```

Example of fourth-generation DBMS redefinition:

```
01,AA                 VENDOR
02,AB,5,A,DE          REGION
02,AC,3,U,DE          DEPARTMENT
02,AD,2,U,DE          OFFICE

SV=AB(1,5),AC(1,3),AD(1,2)   VENDOR-ID
```

Example of second-generation redefinition in a fourth-generation DBMS:

```
01,AA,10,A,DE         VENDOR-ID

SV=AA(1,5)            REGION
SW=AA(6,3)            DEPARTMENT
SX=AA(9,2)            OFFICE
```

CW Chart

Owning a fourth-generation DBMS offers no guarantee against seeing second-generation practices pop up in your code. In this example, redefinition sets a length for the relational DBMS fields, which ordinarily have no specified length. Thus, redefinition effectively freezes out the flexibility that is so critical to protecting a software investment.

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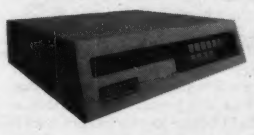

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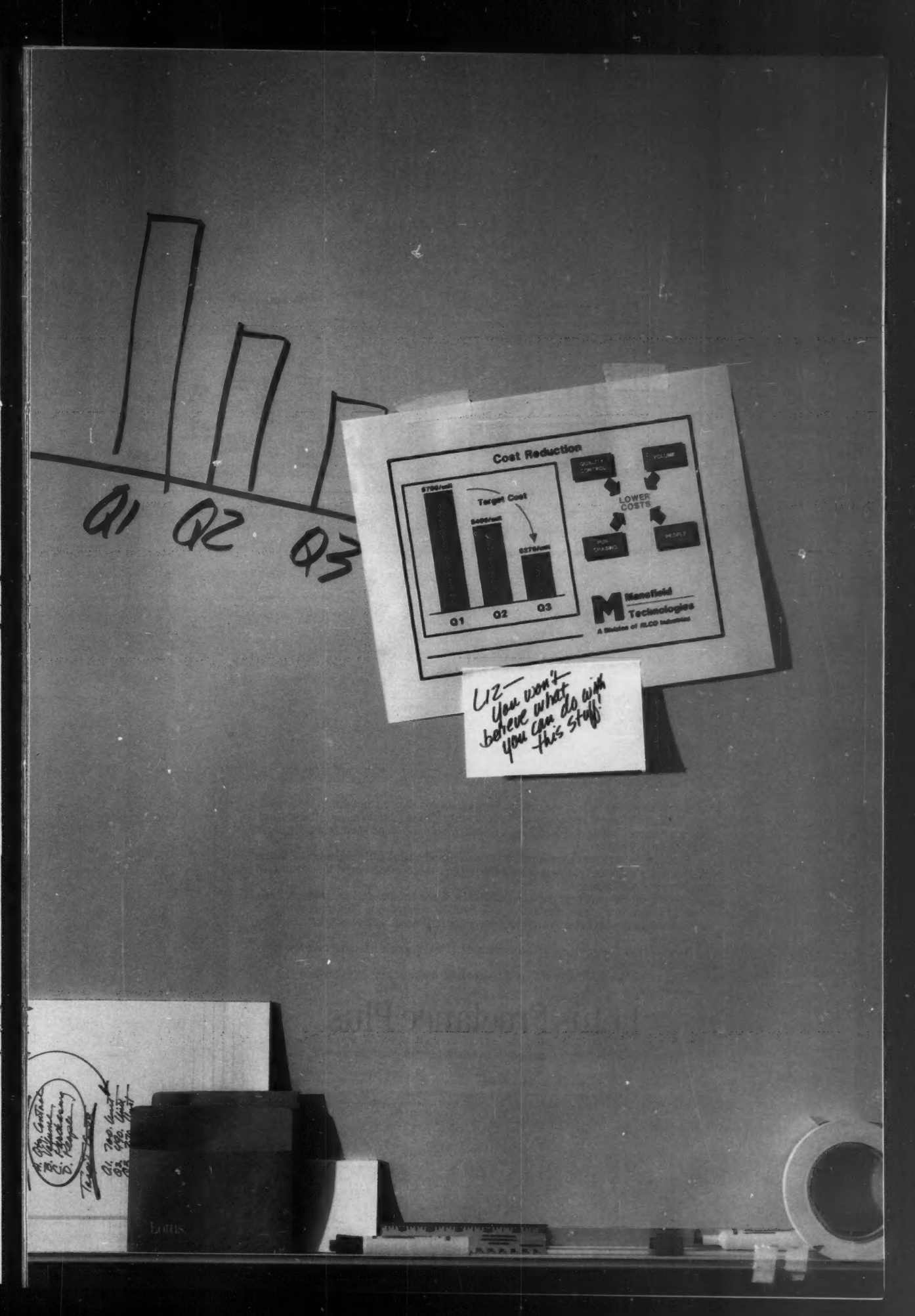
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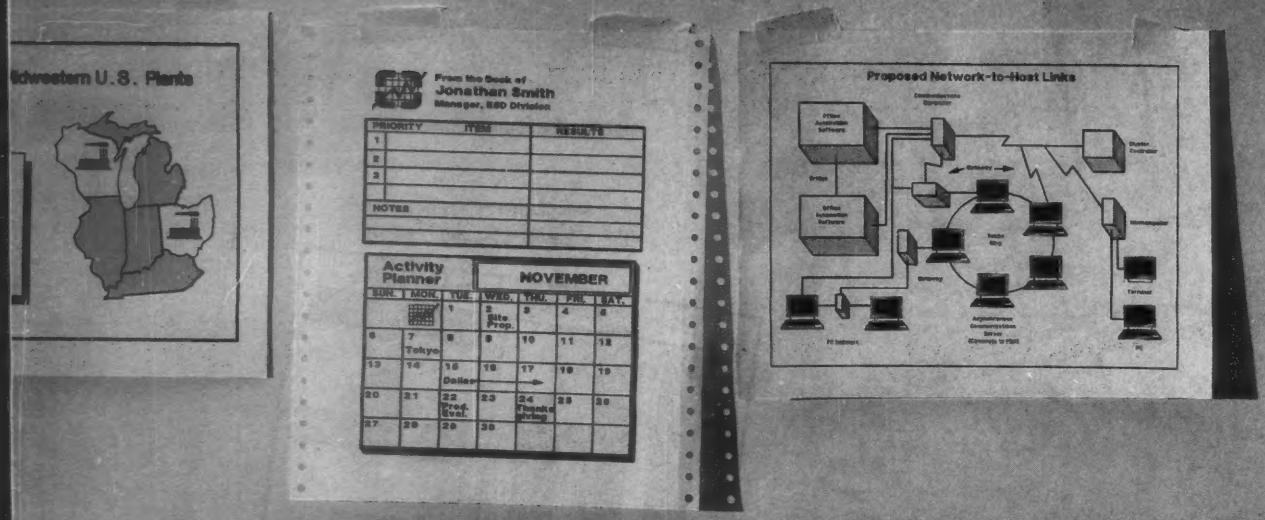

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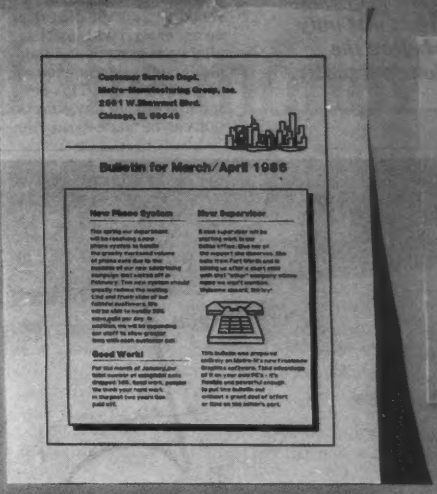

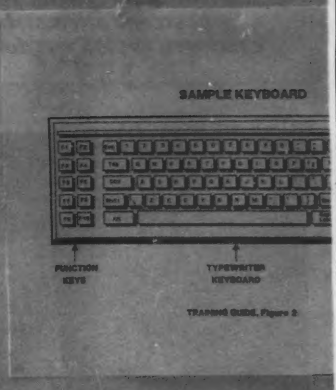

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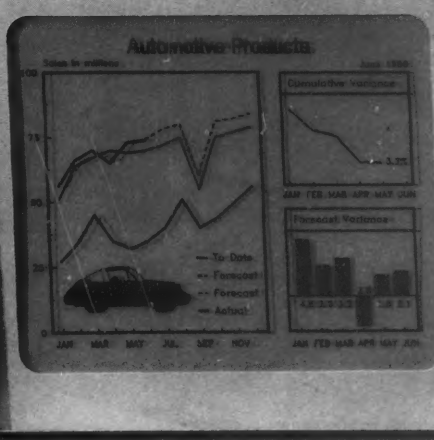


> ***The most direct solution to a problem will often be found in its initial efforts. Although much can be learned from the work that went on before, the history of a job does not reside in the previous computerized system. That was only the second attempt; before the computer, the job was done manually.***

cases in which a designer has defined elaborate access paths to the data, programmers may find following specifications difficult.

Where the design holds an obvious flaw, the difficulties will mask the error until the project lags far behind schedule. It is the confident designer who will say that all data is present and flexible enough to accommodate any requirement. This person knows that any adaptation can be made to the file without compromising its integrity.

Such a designer will have reserved perhaps 5% of the project funds and schedule in anticipation of an early completion and will then revisit the system and make retroactive alterations to fit established requirements.

Carryover descriptions

DBMS file descriptions will not be mirror images of existing file layouts. There are efficient Cobol file formats and efficient DBMS files. To assume that all Cobol files are efficient and that merely moving such structures to a DBMS will make them efficient or continue their efficiency is fallacious.

Some system considerations in Cobol have no equivalents in data base systems. In fact, second-generation designs that are carried over to a DBMS design will hinder effective use of the system.

The combination fields described above are typical of such methods, which were originally necessary to reduce sort times or to index through an earlier access method that provided only single keys.

To avoid these drawbacks, experienced designers should be more willing to adopt new ideas — to be less pedantic, more receptive and extremely wary of compromising a bright new technology with old philosophies. Exact copies of files produced by second-generation methodologies should not be in DBMS applications.

File descriptions are simultaneously the first step in developing DBMS applications and the last step in evaluation. System engineering can be eased considerably when the flexibility of the DBMS is counted on to provide a finished product.

Simplicity is the best policy

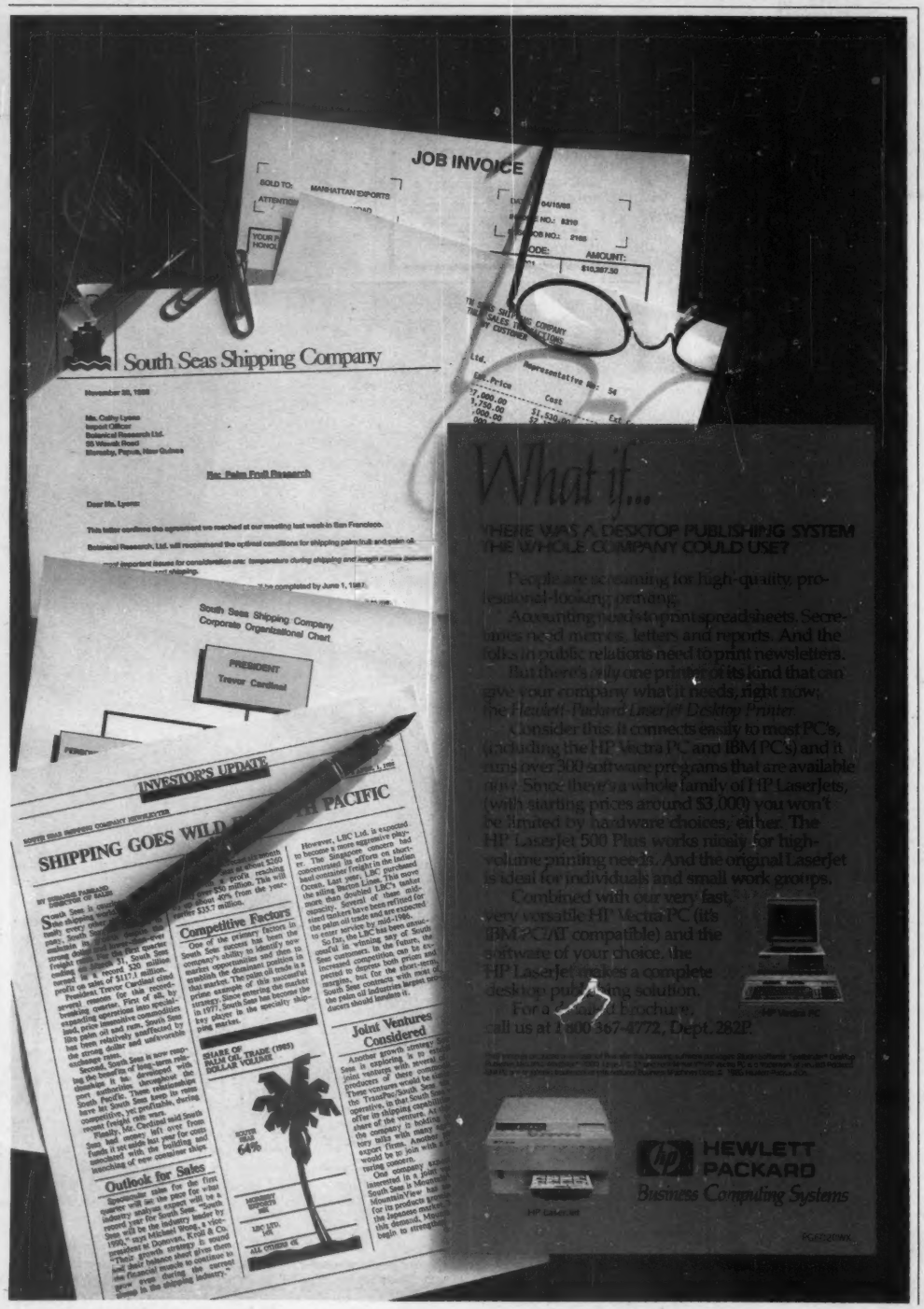
Overengineering by using DBMS features without planning, justification or anticipation of a need is always expensive and may be the largest cause of system failures.

At the outset of a project, the goal is to make the system work. A system that works can always be made to work better with good management and support.

Despite the advances in our industry, the computer cannot apply time and money where both have been so misapplied that none of either is left.

The objective of technology is simplicity, and the most direct solution to a problem will often be found in its initial efforts. Although much can be learned from the work that went on before, the history of a job does not reside in the previous computerized system. That was only the second attempt; before the computer, the job was done manually. The way a job can be done best is frequently found in the methods employed before it was automated.

With the flexibility provided by relational DBMSs, active direction from end users, tools to develop prototypes rapidly and good management, a fresh start from this point will mean everything in bringing application software development to a successful conclusion. ■



In Depth

Cost control: Where has all the money gone?

How does the information systems executive measure his cost of production? He doesn't. If MIS spending doesn't go up more than 6% to 10% per year, he considers himself a hero.

By J. ROBERT RIGGS

Someday, the economic realities of information systems and data processing will fall on the vice-presidents, directors and managers of information systems, primarily those in the Fortune 1,000 industrial companies — not like a feather, but like a ton of bricks.

The total sales for these companies for 1986 is estimated to be around $3 trillion. Assuming a conservative 1.5% of sales is spent on systems and data processing, these companies are spending $45 billion per year in these two areas.

Yet approximately $13.5 billion of these DP dollars are wasted because up until now, MIS executives in most of these companies have not been held subject to the commonsense rules of business — requiring full cost-justification of all expenditures — that guide the decision making process of other corporate executives.

Who's in control?

The executives in charge of manufacturing have committed their lives to becoming or continuing to be low-cost producers. They know their unit costs and tediously measure their production costs to be sure the costs are on track. Most manufacturing executives have established some sort of cost system, which they track with religious fervor. Their jobs and the success of their companies depend on it.

Marketing executives gauge their operations on the bottom-line results of cost per call, cost per order or some other measure appropriate to the business. They certainly don't run by the seats of their pants. Engineering executives are measured on the cost of bringing a product to market, on a project basis or on both.

How does the MIS executive measure his cost of production? He doesn't. If MIS spending does not go up more than 6% to 10% per year, he considers himself a hero. He has no idea whether his unit costs of production are up or down or the same. In fact, he hasn't even thought about the unit cost of producing DP products. But he should — and he will.

A recent article in the *Wall Street Journal* featured an MIS executive who had sponsored a spending binge over a six-year period. Suddenly finding himself under fire because of his department's excessive spending, the executive shifted gears. He started purchasing used equipment, using existing equipment more effectively and questioning requests for additional equipment; he also set up a corporate review committee.

Such measures are useful, but they are a poor substitute for effective cost controls based on traditional management control systems. The MIS executive was quoted as saying his company was "92% of where it wanted to be, and there isn't much pressure for the other 8%." Ninety-two percent of what? Such inane comments have become a hallmark of the MIS executive. Top corporate executives do not engage in such mindless palaver.

Micros not the answer

Unfortunately, the MIS executive is getting little or no help from academics and most consultants. These theoretical experts are not helping to map out the real issues on cost control, cost reduction and cost containment. Instead, they seem completely enamored of end-user computing, as if it were a really strategic MIS issue.

Many academics and consultants have joined ranks to try and force a focus on end-user computing. End-user computing is important, but not strategically critical by any means.

Most personal computer work done by executives is basic and should be handled by the MIS executive's staff. Non-MIS executives should definitely take advantage of the technology, but they do not need to hunt and peck their way to the optimum solution. Trained experts do a much better, faster job.

No company is going to achieve a major competitive advantage through end-user computing. The resources controlled by the MIS executive have enormous potential for competitive advantage, but such advantage will not be found among end users hacking

ILLUSTRATION BY MARK STEELE

About the author

Riggs is president of J. Robert Riggs Co., a Dallas firm specializing in strategic systems planning, MIS cost evaluation and networking. Previously, he was staff vice-president, information systems planning, for Dresser Industries, Inc.

> ***Information systems technology is probably the single most important tool companies possess to increase market share, competitive position and profitability. In this scenario, end-user computing is a second-tier activity.***

away at a PC. Competitive advantage will be found through innovative, imaginative strategic systems planning jointly developed by the MIS executive and key corporate, manufacturing, marketing and engineering executives.

Information systems technology is probably the single most important tool companies possess to increase market share, competitive position and profitability. In this scenario, end-user computing is a second-tier activity — important in its own right, but one on which the MIS executive does not want to concentrate.

Measuring DP production

Companies want effective leaders who will run information systems like a business inside a business. To do this, these leaders, as a basic starting point, must develop and track the unit cost of producing DP products.

The measurable production of any DP operation comprises three kinds of output:

- On-line display of data.
- A batch report.
- An interactive session.

These three categories are useful for determining costs as well as pricing. Each execution of an on-line program has a specific cost, each interactive session has a specific cost and each batch job has a specific cost.

In fact, it is important that each unique on-line transaction be cost-repeatable — that it incur the same cost each time it is executed. The same is true of a batch job with the same input. Interactive sessions, because of variable functions in each session, are usually not repeatable.

MIS executives must determine their costs for each of these three types of DP production. If, for example, IBM's CICS is the monitor and 2,000 CICS programs reside in the library, then there should be 2,000 unit costs for the on-line program library.

Similarily, MIS executives should determine their cost on each batch job, detailing the cost by the programs comprising the batch run. Predetermined or standard costs are generally not feasible for interactive sessions.

Although no specific standards can be established for interactive sessions, an accounting system can be set up that can monitor standardized, billable activities as they occur — for example, the number of CPU seconds used, the number of disk accesses made and so on.

Constructing DP costs

Constructing the cost of DP products is not a simple task, although I will simplify my assumptions in my attempt to illustrate the procedure.

Each of the elements of cost should be allocated to the three classes of transactions — on-line transactions, batch jobs or interactive sessions — or treated as a direct charge to users. To make the allocations, it is important to assign costs as directly as possible. For example, the CPU supporting on-line transactions normally handles very little batch work during on-line operations. On-line and batch processing do not coexist peacefully when high-performance (3 seconds or less) on-line response and consistency of response is required.

Thus, the cost of the on-line CPU is assigned mainly to the on-line transaction category. Similarly, each element of cost is analyzed to determine how the resources are actually used and assigned to the appropriate category.

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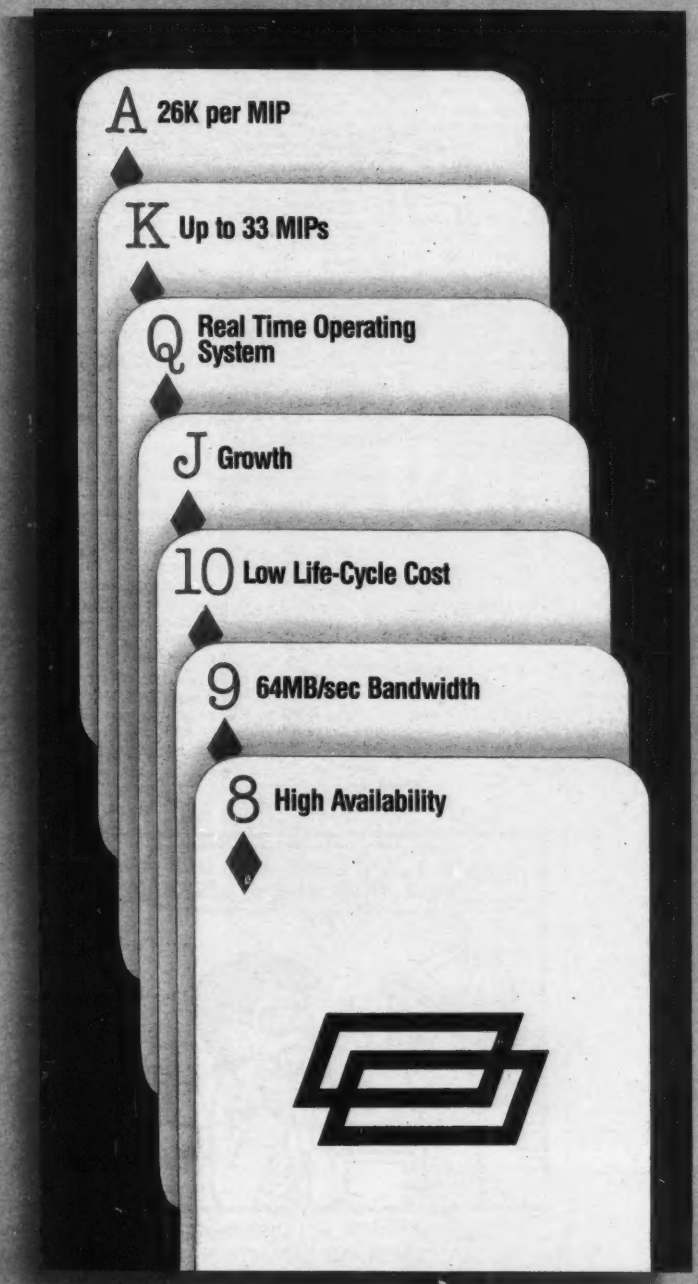

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Example: Annual cost of batch processing

This breakdown for a large DP shop is based on Amdahl 5860-class CPUs.

Item	Quantity	Monthly Cost	Annual Cost
Processor #1	1	$ 75,000	$ 900,000
Memory		10,000	120,000
Channels		7,000	84,000
Processor #2	.5	100,000	600,000
Channels		2,000	12,000
Printer	2	600	14,000
CRT Controller	5	900	54,000
CRTs	10	100	12,000
Operators	12	2,000	288,000
Systems Programmers	5	4,000	240,000
Occupancy			150,000
Electricity			110,000
Control Software			450,000
Total			**$3,034,000**

Information based on cost figures for Dresser Industries, Inc. in Dallas, during a 15-year period. Dresser is a $14 billion manufacturer of industrial products.

The cost of batch processing, combined with that of on-line transactions, interactive sessions and end-user activity, determines the total cost of DP services. Once costs are pinned down, DP can set accurate prices for chargeback.

the system (CPU, disk, tape and so on) is a very detailed and tedious procedure that initially requires a lot of work. Subsequent annual revisions can be accomplished with minimal effort, however, unless major structural changes occur. For example, total annual costs to support batch processing should be converted to a unit cost by dividing the total by the estimated number of units of production (see table at left). The denominator I have found to be the best measure of unit production for the CPU facility is number of billable application CPU seconds — the estimated number of actual CPU seconds end users will consume for applications programs, excluding CPU seconds for control programs, utilities, housekeeping and so on.

A CPU facility of the size designated in the table, utilizing two processors, one fully dedicated and one half-dedicated, should be able to process at least 3.6 million billable CPU seconds per year. We divide the $3,034,000 estimated cost for batch CPU processing by 3.6 million CPU seconds, yielding a standard cost per second of 84 cents.

The average batch job containing four program executions processed in this size facility consumes about 4.5 seconds and produces 5,000 lines of printed output. For the figures given in the table, the CPU cost per job would be $3.78. Add disk accesses, tape accesses and printing to the CPU cost, and the total cost for an average batch job is $8.60 per job, including fully absorbed overhead. This process is repeated for each of the transaction categories.

Once the cost for each service is determined, it is a matter of policy as to how prices are established. Here, management must establish objectives and priorities and set prices accordingly. For example, if policy is to encourage on-line processing, the markup above cost for on-line transactions might be small — say, 15%. Batch prices in this scenario might be established at 100% beyond the cost of production.

Facing economic reality

The proposed costing and pricing approach advocated here unites the MIS executive, corporate staff members and operating executives and brings them face-to-face with the economic realities of data processing. This approach provides order and makes business sense out of the confusion and subjective evaluation of DP operations.

Assuming a good costing and billing system is established, the vice-president of marketing might propose an on-line order management system that he believes will provide a competitive advantage in the marketplace, increasing market share and raising gross margins by 2%.

The MIS executive can now work with marketing to design a system

Cost estimate for a new system

An estimate of monthly costs to operate a new on-line order management system in a large company with 10 marketing offices.

	Quantity	Unit Cost	Monthly Cost
On-Line Transactions	150,000	$ .03	$ 4,500
Batch Jobs	140	8.60	1,204
Disk Storage in Megabytes	100	4.17	417
Tape Storage in Reels	50	1.78	89
Communications Lines	10	850.00	8,500
Software Amortization			1,000
Total			**$15,710**

Information based on cost figures from Dresser Industries, Inc., Dallas.

Once monthly costs for a new system are projected, the MIS executive can weigh them against the expected benefits — and against the cost of retaining a third-party provider.

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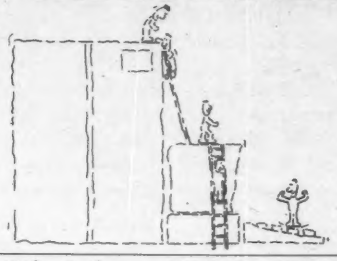

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and provide definitive, believable costs so that marketing can work through a cost/benefit analysis.

At the conclusion of preliminary design, the MIS executive might present an estimate for an on-line order management system for a 10-marketing office organization (see chart page 80). These are economic realities. The presentation is unambiguous. If the marketing executive determines that the benefits exceed the cost of $15,710 per month, then he will probably proceed.

If not, he will come back to the MIS executive, and together they will develop alternatives. For example, with accurate in-house costs in hand, it is possible — even desirable — to test the third-party services market to see whether the system could be provided at less cost through a third-party vendor.

Heresy? When MIS executives display the kind of objectivity and managerial responsibility this approach implies, their professional status is considerably enhanced. They are no longer seen as high priests building empires but as competent, savvy business executives trying to do what is right for their companies.

Some will argue that in-house costs are "funny money" and thus cannot be compared with outside service providers. This is a smoke screen. Inside costs are not funny money — the costs are real. The argument, often heard, that the computer and people are already there and available so the new application will not cost anything, is pure hokum. There will be incremental costs — these are just a matter of time. The new application may not force the need for more computers, more disks and more people immediately, but the next one will. There are no free lunches.

The MIS executive with a good grasp of costs will insist that every application be supported by sound cost/benefit analysis. This approach recognizes economic realities and contributes to profit improvement and bottom-line results.

Getting serious

As the information systems function matures and top corporate executives take an increasing interest in the competitive advantage available through computer-based information systems, MIS executives will have to adapt to the economic realities of running a business inside a business. When chief executive officers turn the spotlight on the information systems function, here is what they should see:

- A lean, aggressive MIS staff with a track record of end-user satisfaction and a reputation for bringing innovative, profit-improving projects to successful conclusion on time.
- An MIS staff that has developed an effective costing system to measure its own performance, to project the cost of new applications and to be cost-responsible.
- An MIS staff that understands and supports cost/benefit analyses for major systems projects — one that rejects fuzzy-minded, technology-aggrandizing reasons for systems projects.
- An MIS staff that understands economic realities and takes its place beside manufacturing, marketing and engineering as a cost- and profit-conscious organization.

When MIS executives can favorably match their organizations and operations to these four criteria, they will be truly successful. Until they can, they will not be taken seriously. These are the economic realities of information systems. ■

> ***When MIS executives display the kind of objectivity and managerial responsibility this united approach implies, their professional status is considerably enhanced. They are no longer seen as high priests building empires but as competent, savvy business executives trying to do what is right for their companies.***

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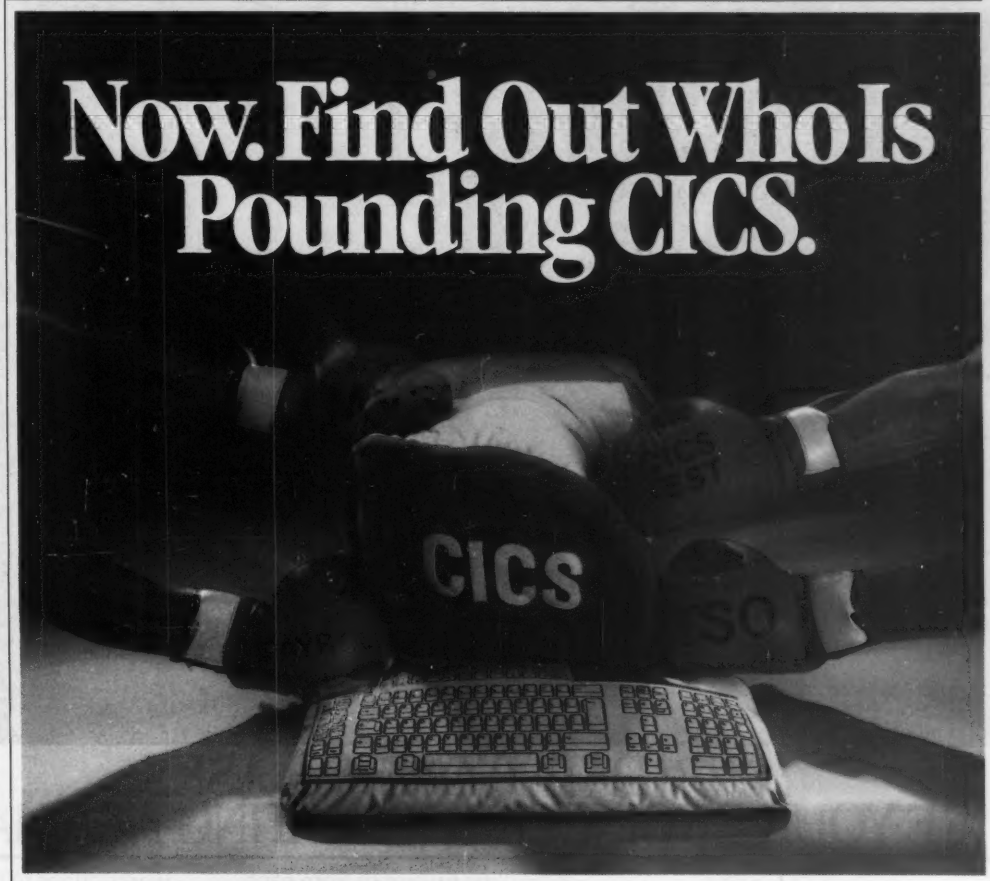

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MANAGEMENT

TAKING CHARGE
J. Daniel Couger

E pluribus computum

SECOND OF TWO PARTS

In last week's excerpt, Couger described a study of 17 large companies, which found 11 had end-user programs with "serious problems" such as low return on investment. He found most of the troubled companies failed to anticipate their costs and tried to impose "hard controls" — rigid policies for policing end users. Here Couger turns to the successful operations.

Ironically, the companies with good end-user computing operations spent no more — and often spent less — than the businesses with problems. Successful companies planned for efficiency and effectiveness and applied standard cost-benefit analyses to determine return on investment.

All the successful companies in these examples did two things: They were proactive rather than reactive when developing end-user policies and support teams, and they used soft rather than hard controls. Managers in the six successful companies took charge — establishing end-user policies to prevent cost overruns related to personal computers. As a first step, companies set standards for all purchases related

See **E PLURIBUS** page 90

Couger is Distinguished Professor of Computer and Management Science at the University of Colorado, Colorado Springs. Reprinted by permission of the Harvard Business Review. *Excerpts from "E pluribus computum" by J. Daniel Couger (September/October 1986).* *Copyright © 1986 by the President and Fellows of Harvard College; all rights reserved.*

Georgia Power bills users

Chargeback system aids cost cutting, planning

By David A. Ludlum

ATLANTA — Information systems managers generally do not applaud cuts in spending for their departments, but managers at Georgia Power Co. are happy about one component of a reduction in their systems budget for next year.

That component is a chargeback system, implemented in response to what were perceived as high information systems costs. Planning of the system began in June 1982, and it was put in place in January the following year.

DeBardeleben

While Georgia Power has not quantified dollar savings from chargeback, William DeBardeleben Jr., supervisor of information services budgets, says next year's budget is the first to decline — falling about 3% from the previous year's level — in the past four or five years, in part because of chargeback.

"The primary benefit that I've been able to see is the increased awareness of users that what they're doing does cost something, and they can do something to control it. Prior to this they would just do things," DeBardeleben says. Users now look at alternative ways of doing those things — using a mainframe or personal computer, time-sharing or minicomputers. "It used to be [users would do the] first thing they thought up," DeBardeleben says.

Georgia Power is a subsidiary of Southern Co., which also owns utilities in adjoining states. Some of the utilities' corporate information services are provided by another subsidiary, Southern Company Services, Inc. Southern Company Services and Georgia Power each operate an Amdahl Corp. mainframe. Georgia Power also operates three IBM 4300 series

See **GEORGIA** page 89

Firms build data centers quickly

By Mitch Betts

BELTSVILLE, Md. — Many companies expecting new computer systems to arrive in a few months have given no thought to building a computer room, says A. S. "Migs" Damiani, president of Com-Site International, Inc.

That explains why MIS and facilities managers are increasingly turning to companies such as Com-Site and DP Facilities, Inc., which specialize in designing and building data centers and doing it especially quickly to meet tight deadlines.

This new specialty industry is particularly important for MIS departments with hardware requirements that are growing by leaps and bounds. "Sometimes a firm's need for hardware expands exponentially, which forces a rapid migration," says Mark Gerard, president of DP Facilities in New York.

That was certainly the case with Cullinet Software, Inc. in Westwood, Mass. "We were totally out of space in our old data center, and we had a new machine coming in with no place to put it," says Howard Kelman, manager of systems and planning for Cullinet.

"Our growth at Cullinet, in terms of hardware, has been in excess of 70% per year for the last couple of years, so we outgrew our old room pretty fast," he explains.

Consequently, Cullinet launched a project to build a 14,600-sq-ft corporate data center before its new IBM 3084 arrived and eventually selected Com-Site as the general contractor. "At first we started down the path with another contractor. But they just didn't know what they were doing, so we dismissed them and brought in Com-Site," Kelman says.

Kelman says Com-Site, in Beltsville,

See **FIRMS** page 85

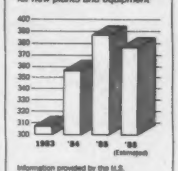
INSIDE

Calendar: Selected conferences, exhibitions, seminars/**84**

INSTANT ANALYSIS

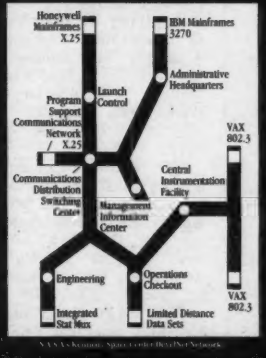
"If someone says to me, 'I want to go to the Orient,' I say, 'Visit MIT.' "
— Ross Perot, founder and chairman, Electronic Data Systems Corp., on a lack of emphasis on education in the U.S.

Capital spending
U.S. businesses' expenditures for new plants and equipment



Information provided by the U.S. Department of Commerce.
Figures adjusted for inflation - 1982 dollars.

The Common Sense Data Network



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CALENDAR

NOVEMBER 23-29

Conference for Artificial Intelligence/Expert Systems. Boston, Nov. 24-25 — Contact: Software Tools Conference, Suffolk University, Boston, Mass. 02108.

Satellite Telecourse on Distributed Processing. Atlanta, Nov. 24-26 — Contact: Association for Media-Based Continuing Education for Engineers, Inc., Department DP, 500 Tech Pkwy. N.W., Atlanta, Ga. 30313.

NOV. 30-DEC. 6

Engineering Workstations and the PC. Bedford, Mass., Dec. 1-3 — Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Optical Fiber Communications. Colorado Springs, Dec. 1-5 — Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Information Security: The Challenge. Monte Carlo, Dec. 2-4 — Contact: Marie-Martine Sainflou, Agence de l'Informatique, Tour Fiat-Cedex 16, Paris — La Defense, France.

MAP/TOP Courses. Boston, Dec. 2-4 — Contact: Ship Star Associates, Inc., 36 Woodhill Drive, Newark, Del. 19711. Also being held Dec. 18-19 in Atlanta, Jan. 12-16 in Phoenix, Feb. 19-20 in Orlando, Fla., and March 10-12 in Washington, D.C.

DEC: The Next Five Years. San Francisco, Dec. 3-4 — Contact: The Yankee Group, Seminar Division, 14th Floor, 89 Broad St., Boston, Mass. 02110.

Electronic Mail Industry Conference. Dec. 3-4, Washington, D.C. — Contact: EMA, Suite 300, 1919 Pennsylvania Ave. N.W., Washington, D.C. 20006.

Matrix Eight (The Graphic Communications Association's Annual Conference). Fort Lauderdale, Fla., Dec. 3-5 — Contact: Suite 604, 1730 N. Lynn St., Arlington, Va. 22209.

Long Range Information Systems Planning. Philadelphia, Dec. 3-6 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020. Also being held Dec. 8-11 in New York.

The 1986 Computerized Plan Administration Institute. Hollywood, Fla., Dec. 3-6 — Contact: Registrations Department, International Foundation, P.O. Box 69, Brookfield, Wis. 53008.

California Computer Show. Palo Alto, Calif., Dec. 4 — Contact: Norm De Nardi Enterprises, Suite 204, 289 S. San Antonio Road, Los Altos, Calif. 94022.

Software Rapid Prototyping. Dallas, Dec. 4-5 — Contact: EFDPMA Seminars, Dept. SRP, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held Dec. 11-12 in Anaheim, Calif.

Strategic Planning and Information Systems. New York, Dec. 4-5 — Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

DECEMBER 7-13

Software Testing Management Workshops. Jacksonville, Fla., Dec. 7-12 — Contact: Software Quality Engineering, Suite 16, 3015 Hartley Road, Jacksonville, Fla. 32217. Also being held Feb. 15-20 in Orlando, Fla., and March 1-6 in San Diego.

Disaster Recovery/Contingency Planning Seminar. Cleveland, Dec. 8-9 — Contact: ISR Consultants International, Inc., Suite 103, 3455 Washington Drive, Eagan, Minn. 55122.

Financial Microcomputer Conference. Atlanta, Dec. 8-9 — Contact: Financial Managers Society, Inc., Suite 2221, 111 E. Wacker Drive, Chicago, Ill. 60601.

Applying Machine Vision to Electronic Component Assembly and Inspection. San Jose, Calif., Dec. 8-10 — Contact: SME Special Programs, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

The National Connectivity Symposium on Local Area Networks and Micro-Mainframe Links. Washington, D.C., Dec. 8-11 — Contact: Digital Consulting Associates, Inc., 6 Windsor St., Andover, Mass. 01810.

The IBM PC Data Communications Survival Course. Boston, Dec. 9 — Contact: Data-Tech Institute, P.O.

See CALENDAR page 88

AT&T IS IN A BUSINESS SURVIVAL KIT.

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Firms build data centers

From page 83

Md., got the job done in about four months. "We've lived in the room for about a year and haven't changed a thing," he adds.

Likewise, it took only about four months for Com-Site to build an 18,000-sq-foot data center in Landover, Md., for the U.S. Office of the Comptroller of the Currency (OCC), and it was based on sketchy specifications. "It was one of those things that needed to have been done yesterday," says Dexter Cashwell, realty specialist at the OCC. "Speed was a very important element to us. And they were able to deliver in a much faster time frame than we realistically expected." Com-Site typically designs and builds a 40,000- to 60,000-sq-foot data center in 12 to 16 weeks, compared with the 12 to 18 months often required by traditional building techniques, company officials say. To save time, the company tackles several steps simultaneously. For example, once the preliminary design is completed, the company will order the needed air-conditioning and electrical power equipment before construction begins, avoiding procurement delays.

In addition, Com-Site has a computer hardware engineering staff that keeps abreast of the environmental requirements of various computer models and uses a computer-aided design and drafting system to prepare layouts. It also rarely uses any subcontractors, assigns one manager to lead the project and has close ties with its equipment suppliers, officials say.

DP Facilities advertises that it has built more than 600 data centers, and, as Com-Site does, the company provides a guaranteed completion date.

The key to a successful and speedy project is to avoid the coordination problems inherent in using several different contractors, says Mark Gerard of DP Facilities. "The in-house coordination [by a single contractor] can make for a very quick turnaround time in getting something from a concept to an operating environment."

Study finds CEO use of computers up

Chief executive officers and other top managers are spending more time with computers but are using them to review information rather than manipulate data for planning, according to a study by Stanford University researchers.

Of senior executives at 1,000 U.S.-based companies with sales between $10 million and $2.5 billion, only about 10% were found to use a computer regularly. Those senior executives said they use their computers an average of seven hours a week and 61 minutes per session. "Conventional wisdom maintains that executives spend most of their time with people. Yet, here they are spending a good portion of each day at their computers," said Jeffrey Moore, assistant dean of Stanford's Graduate School of Business, who conducted the study.

Asked which computer function is most important, 38% of the executives said management information; 30% said decision support.

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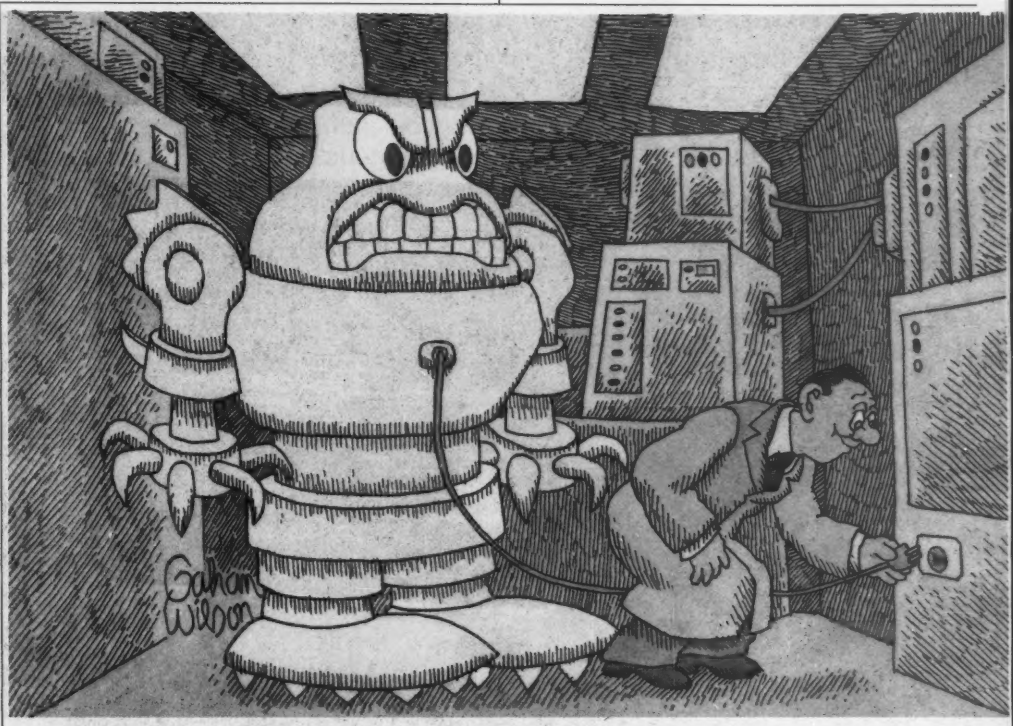

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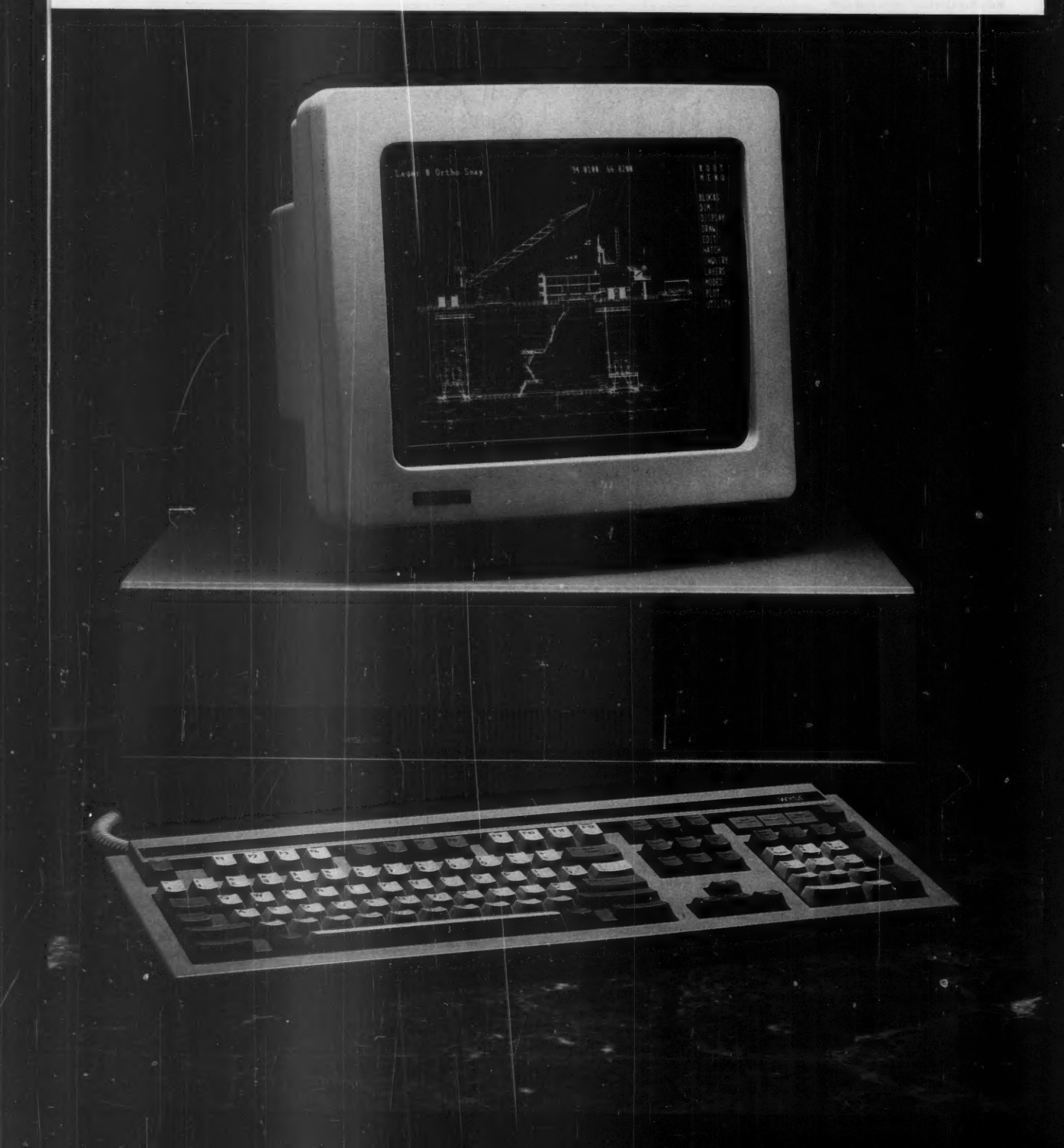

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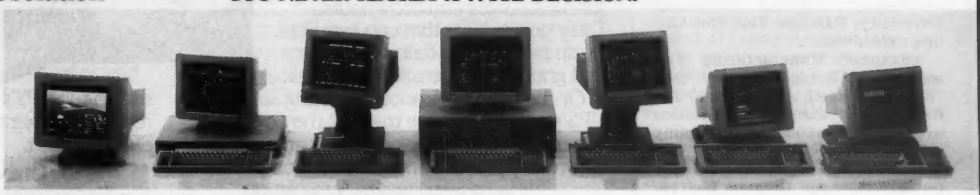

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CALENDAR from page 84

Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

The 4th Computer Symposium for Local Government. St. Cloud, Minn., Dec. 9-10 — Contact: Government Training Service, 202 Minnesota Building, 46 E. Fourth St., St. Paul, Minn. 55101.

How to Design and Implement Bar Code Systems. Clearwater Beach, Fla., Dec. 9-10 — Contact: Nancy Loerch, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Managing and Motivating Computer Professionals. Chicago, Dec. 9-11 — Contact: Gary Slaughter Corp., 400 Fifth Ave. S., Naples, Fla. 33940.

Optical Information Systems '86 Conference. Arlington, Va., Dec. 9-11 — Contact: Conference Management Corp., 200 Connecticut Ave., Norwalk, Conn. 06854.

International Conference on Management and Performance Evaluation of Computer Systems. Las Vegas, Dec. 9-12 — Contact: Computer Measurement Group, 6397 Little River Tnpk., Alexandria, Va. 22312.

1986 CAUSE National Conference. Monterey, Calif., Dec. 9-12 — Contact: Professional Association for Computing and Information Technology in Higher Education, 737 29th St., Boulder, Colo. 80303.

Software Quality Control Management Information System. Boston, Dec. 11 — Contact: James Ettwein, International Datatek, 7 Carriage Drive, Acton, Mass. 01720.

ACE's Third Annual Computer Education Conference. New York, Dec. 13 — Contact: Association of Computer Educators, Inc., 751 Bard Ave., Staten Island, N.Y. 10310.

DECEMBER 14-20

Seventh Annual Data Training Conference and Exposition. Washington, D.C., Dec. 14-18 — Contact: Julia Stasio, Conference Registrar, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

Fostering Creativity and Innovation. (Satellite Broadcast) Dec. 15-19 — Contact: National Technology University, P.O. Box 700, Fort Collins, Colo. 80522.

Advanced Manufacturing Systems-West '87. Anaheim, Calif., Dec. 15-17 — Contact: John Frett or Bill Harrington, Cahners Exposition Group, P.O. Box 5060, 1350 E. Touhy Ave., Des Plaines, Ill. 60017.

Effective Management Skills for the MIS Manager. Chicago, Dec. 15-18 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

Improving Your Internal Consulting Skills. Washington, Dec. 15-18 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

Dexpo East 86 Show and Microcomputer Graphics Show. New York, Dec. 17-19 — Contact: Expoconsul International, Inc., 3 Independence Way, Princeton, N.J. 08540.

JANUARY 4-10

Hawaii International Conference on System Sciences. Kailua-Kona, Hawaii, Jan. 6-9 — Contact: Center for Executive Development, College of Business Administration, University of Hawaii, B-101, 2404 Maile Way, Honolulu, Hawaii 96822.

Ten Unix Seminars. Fremont, Calif., Jan.7-10 — Contact: Uni-Ops, P.O. Box 27097, Concord, Calif. 94527.

JANUARY 11-17

Business Automation Forum. Fort Lauderdale, Fla., Jan. 11-14 — Contact: Recognition Technologies Users Association, P.O. Box 2016, Manchester Center, Vt. 05255.

Interfacing Sensors with the IBM PC. Madison, Wis., Jan. 12-14 — Contact: Department of Engineering Professional Development, University of Wisconsin at Madison, 432 N. Lake St., Madison, Wis. 53706.

Winter MAP/TOP Users Group Meeting. Phoenix, Jan. 13-14 — Contact: Society of Manufacturing Engineers, Technical Activities Division, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Computer Graphics '87. San Diego, Jan. 14-16 — Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

The Society for Computer Simulation 1987 Multiconference. San Diego, Jan. 14-16 — Contact: SCS, P.O. Box 17900, San Diego, Calif. 92117.

Data Communications and Networking for the IBM PC XT/AT and Compatibles. New Brunswick, N.J., Jan. 15-16 — Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Feb. 5-6 in Los Angeles and Feb. 19-20 in Chicago.

JANUARY 18-24

Pacific Telecommunications Council Ninth Annual Conference. Honolulu, Hawaii, Jan. 18-21 — Contact: Room 308, 1110 University Ave., Honolulu, Hawaii 96826.

Comlease Winter. New Orleans, Jan. 19-23 — Contact: The Information Exchange, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

Buscon-West. Los Angeles, Jan. 20-21 — Contact: The Bus/Board Users Show & Conference, No. 116, 17100 Norwalk Blvd., Cerritos, Calif. 90701.

Uniforum 1987. Washington, D.C., Jan. 20-23 — Contact: Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

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There are times when you need full uninterruptible power supply (UPS) protection for your computer.

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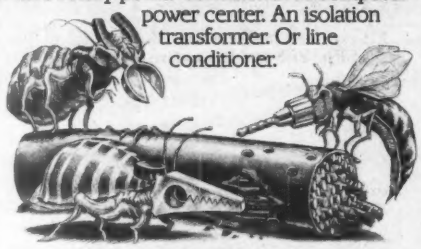

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Winter 1987 Usenix Technical Conference. Washington, D.C., Jan. 21-23 — Contact: P.O. Box 385, Sunset Beach, Calif. 90742.

JANUARY 25-31

Mapper Installation, Coordination and Support. Dallas, Jan. 26-30 — Contact: Compumetrics Training Institute, P.O. Box 58383, Houston, Texas 77258.

Annual Conference on Improving Productivity in EDP System Development. Phoenix, Jan. 27-30 — Contact: Applied Computer Research, Inc., P.O. Box 9280, Phoenix, Ariz. 85068.

Computer Graphics New York '87. New York, Jan. 28-30 — Contact: Exhibition Marketing & Management, Inc., Suite 690, 8300 Greensboro Drive, McLean, Va. 22102.

Seybold Group Conference on Desktop Communications. San Francisco, Jan. 28-31 — Contact: The Seybold Group, Inc., 20695 Western Ave., Torrance, Calif. 90501.

FEBRUARY 1-7

1987 ABA Bank Telecommunications & Data Processing Workshop. San Diego, Feb. 1-4 — Contact: American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

The Third International Conference on Data Engineering. Los Angeles, Feb. 3-5 — Contact: Professor Gio Wiederhold, Stanford University, Computer Science Department, Marguerite Jacks Hall, Palo Alto, Calif. 94305.

Georgia Power charges users

From page 83

mainframes as well as systems from Honeywell, Inc. and Digital Equipment Corp.

Georgia Power's chargeback system is aimed at controlling costs rather than merely recovering them, DeBardeleben says. It seeks control through raising users' awareness of costs, making users accountable for the costs they incur through "memo budgets" and, for some services, varying charges to manipulate demand, such as charging premiums for scarce resources and varying rates for peak and off-peak hours.

In the allocation of costs through memo budgets rather than the real ones, departments receive memos reporting their information systems costs and budgets. It is expected that overspending must be explained to supervisors. Before the end of a budget year, additional funds would have to be allocated for excess use.

The key to effective memo budgets is strong backing by senior management, DeBardeleben says. "Management has to take memo budgets as seriously as responsibility budgets," he says. "The system can have as much accountability as any other system if the senior management is supportive of it." DeBardeleben says that some of his company's senior managers do not take memo budgets as seriously as actual ones. He says it may take several years for them to do so.

Standardized costs

While it has adopted a flexible pricing policy for manipulating demand for some services, Georgia Power prices other information services through standardized costs to encourage the systems group to control its expenses.

Most charges, both standardized and flexible, are assessed in the form of rates for a computer resource such as processing time, lines printed or storage space. Others are stated per piece of work performed — processing an invoice, for example. Rates per piece of work are easier for the user but time-consuming for the information systems group to calculate, DeBardeleben says.

While Southern Company Services sets some charges according to full costs, including overhead items like rent and depreciation, Georgia Power generally sets the rates it charges on the basis of operating costs, excluding overhead but including development work. The idea is to subject users only to the costs they can control, DeBardeleben explains. The company has not changed market-based pricing because of the difficulty in finding outside services comparable to its own, he says.

Georgia Power's system has been introduced piecemeal and continues to expand. First it included costs of the holding company data center and Georgia Power information services group. The utility's operations group was added next, and costs of hardware and software leases and maintenance will join on Jan. 1.

Next, the company hopes to get users to add their own costs into the system, placing a premium on user cooperation. "As we go to distributed processing, more of the costs are being incurred by the user in his area," DeBardeleben says. "If we don't include that, we get the impression that data processing costs are declining. That's not really happening."

In response to charges, users have shifted some work from resources of the information systems department to their own personal computers. The company hopes to start incorporating some of the costs of that work — equipment, if not employees' time — into the chargeback system by January, according to DeBardeleben.

Next year Georgia Power hopes to add the last major component of the system — telecommunications costs.

The gradual expansion of chargeback has eased its introduction, DeBardeleben says. "You try to bring the whole thing in at one time and you're going to spend a lot of money. It's come along at a speed that users can understand and accept."

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E pluribus computum

From page 83

to PCs. For hardware this is quite simple; PC selection is limited to compatible machines. But several software issues come into question.

A company should choose one operating system that supports many users and provides high-level links so that PCs and mainframes can interact easily. Moreover, keeping several operating systems updated is expensive. The most successful companies supported just one PC operating system. They also standardized their applications packages.

Settling on a single fourth-generation software package is a tougher decision. Users seek two capabilities: flexible information retrieval that lets them pull data from central files in various formats that package data as a report generator would and a strong, easy-to-use modeling capability, permitting nontechnical people to fashion their own applications. No one fourth-generation package excels in both areas; the effective groups chose one in each category.

The successful companies also gave users substantive technical training. While such training won't transform first-time developers into efficient software engineers, it can teach them new tricks and shortcuts to help them squeeze the most from company resources, especially when dealing with spreadsheet development or fourth-generation tools.

A critical goal — and one that's not easily attainable — is motivating the end-user support group to work well with nontechnical users. The attitude many technicians display toward computer neophytes interferes with this relationship. A recent study of more than 6,000 computer professionals revealed little need for social interaction and a great need for challenging work.

Staff problems don't have to detract from end-user computing though, because end users need support from only a few MIS people. Executives can choose the right people to help from those who have the highest need for social interaction.

Motivating staff

Successful leaders of the end-user teams orient assignments to appeal to their employees' need for challenge. The leaders stressed two points that motivated their staffs: centering end-user programs around state-of-the-art tools like fourth-generation languages and conveying that user support is crucial to the whole company because it affects high-level managers, particularly in the information they draw from decision support systems. Only by combining a motivated technical team with aggressive policy-making can a company shape an effective end-user program.

Unfortunately, planning and policy-making are fruitless unless companies can induce users to adopt MIS guidelines. Soft controls work well. Replacing the us vs. them mentality that hard controls generate is an environment that encourages users to experiment, and important breakthroughs can happen. For example, naive users left to develop their own applications drift naturally toward a method called prototyping, in which a simple model is computerized, then tested, enhanced and retested. Despite its rough early state, the model often produces useful results quickly.

The successful companies I studied applied the following soft controls:

- Selected hardware, limiting the machines maintained by the MIS team.
- Centralized purchasing, yielding quantity discounts on the selected PCs, with savings passed on to user departments.
- Limited training, restricted to software that meets MIS standards.
- Consistent software distribution by a central agency, which diminishes the possibility of incompatibility.
- Distributed development, while teaching leaders of end-user programming about good development methodology and explaining that if their applications meet MIS standards, long-term maintenance will be easier and less expensive.
- Software bonuses, such as an E-mail system for communications-compatible PCs.

Even though soft controls often involve offering extras as incentives, they don't cost more. On the contrary, as they limit proliferation, incompatibility and maintenance problems, they foster a creative environment based on mutual cost-reduction goals.

Experts project the installed base of PCs will reach more than 20 million by 1987. But management use is far below predictions. Executives still tend to delegate computing-related tasks other than information retrieval to clerical and technical staff. An accompanying lag in predicted reward — improved white-collar productivity, for instance, and better information for crucial management decisions — is also noticeable.

To change this pattern, companies need to provide more functions with more user-friendly access in an integrated manner. That is, they need to improve the system to enable managers to accomplish all computational and data retrieval functions through English-language commands.

As MIS departments gradually unleash end users, computer professionals must still teach cost control and careful planning as well as cultivate new methods to prod gently rather than police inexperienced users. Liberating end users from the MIS grip is inevitable. The challenge lies in more precise planning of this decentralization.

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ETHERMODEM provides the same performance on Broadband as baseband Ethernet, including high speed links between computers, workstations and CAD/CAM equipment and equal and fair access to all network users, while delivering the high level of trouble-free performance required in large installations.

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NEW PRODUCTS

Software uses modem to link IBM PCs, minis

Ideassociates, Inc. in Billerica, Mass., has introduced the Ideacomm 5250/Modem, a software communications package said to link IBM Personal Computers, PC XTs, ATs and portables to remote IBM System/34, 36 and 38 installations via an internal synchronous modem.

According to the vendor, Ideacomm 5250/Modem offers access to nine concurrent 5250 sessions, providing simultaneous use of any combination of display and printer sessions.

File transfer options include support of IBM's PC Support/36 and PC Support/38. The product also emulates both the IBM 5251 Model 12 and 5294 cluster controllers and the IBM 5251 Model 11, 5291 and 5292 Model 1 terminals. Both the IBM color and monochrome displays are supported.

Ideacomm 5250/Modem is said to configure both serial and parallel PC printers to emulate the IBM 5256 Model 1, 5224 Model 1 and the 5225 Model 1 printers. Any PC at the remote location can use a PC printer as a system printer or can direct output to a system printer.

According to the vendor, standard features of the software are a documented interface allowing users to customize software for use with Ideacomm 5250/Modem, diagnostics and status utilities to verify proper functioning of the link, error detection, recovery features and a hot key feature said to allow the user to move between IBM PC-DOS and emulation.

The Ideacomm 5250/Modem software package, priced at $695, works in conjunction with a Universal Data Systems, Inc. Sync-Up 201 or 208 internal synchronous modem providing 2,400 bit/sec. or 4.8K bit/sec. transmission, respectively.

Ideassociates has also announced enhancements to its Ideacomm 5251 board for PC to IBM System/34, 36 or 38 communications.

The enhancements to the 5251 board include IBM 5292 Model 2 terminal support and 132-col. by 28-line full screen support for its existing 3180 terminal emulation. The Ideacomm 5251 board costs $895.

IBM-compatible printer out

Interface Systems' unit works with System/34

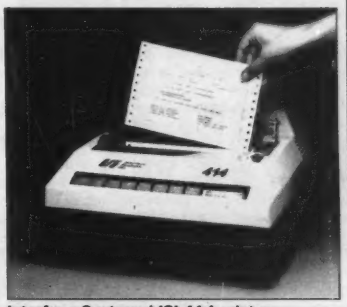
Interface Systems, Inc. has announced that its ISI 414 desktop dot matrix printer is now available in an IBM System/34, 36 and 38-compatible model.

The ISI 414 for the System/34, 36 and 38 is said to be a plug-compatible replacement for the IBM 5256 and 4214 Model 2. It measures 14 in. wide and 13½ in. deep. It does not require an external protocol converter, the vendor said.

Features include a dual twin-axial, Centronics Data Computer Corp. parallel port, which allows simultaneous connection to IBM Personal Computers as well as to the minicomputers. In PC mode, the ISI 414 emulates the test-printing functions of the IBM 5152 personal printer.

Users can print up to 132 char./line at 150 char./sec. Forms can have multiple parts and range from 5 in. to 10 in. in width. A two-line, 16-char. LCD readout on the control panel reports operating status.

The ISI 414 is priced from $2,500 to $3,100, depending on quantity.



Interface Systems' ISI 414 printer

Interface Systems has also announced an agreement with Dataproducts Corp. offering its ISI 8268 dot matrix printer, an IBM 3270 plug-compatible model, to Dataproducts' North American distributors for resale to end users.

The ISI 8268 is said to print at 400 char./sec. in draft mode and 100 char./sec. in near-letter quality mode, with spacing of 10, 12 or 16.7 char./in. Printing can be on continuous feed forms with up to six parts from 5 in. to 15½ in. wide.

Hitachi drives offer SCSI controller

Hitachi America Ltd. in San Bruno, Calif., has announced two 5¼-in. Winchester disk drives featuring NCR Corp.'s single-chip embedded small computer systems interface (SCSI) controller.

The drives are designated the DK512C-17 full-height disk drive and the DK522C-10 half-height disk drive.

They are said to feature common command sets, a 7-byte error correction code, data rates up to 1.5M bit/sec., overhead time of less than 3 msec, direct connection to a single-ended SCSI bus and asynchronous SCSI data transfer.

Quantity pricing

The DK512C-17, priced at $2,830 in quantities of 100, stores up to 172.3M bytes of unformatted data, according to Hitachi America.

The DK522C-10, priced at $2,130 in quantities of 100, stores up to 103M bytes of unformatted data.

According to a company spokesman, the mechanism in the head-to-disk assembly is identical to Hitachi's current DK512 and DK522 series drives.

Modified for SCSI chip

The newly announced disk drives' digital boards are modified to incorporate the SCSI chip.

Embedded SCSI disk drives share common parts with other Hitachi drives, retaining reliability from the previous models.

The units will be available in the first quarter of 1987, according to the vendor.

INSIDE

Software & Services/92
Microcomputers/92
Communications/105
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Price Reductions/117

printf("Hello, IBM world\n");

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The mainframe compiler uses standard IBM linkage conventions. Assembler programs, MAIN routines in other high-level languages, and packages such as IBM's ISPF and GDDM can be invoked directly from C.

And you can use C, instead of assembler, to develop small and fast subroutines called from other languages.

We designed the compiler listing and cross-reference to make programs easy to follow and errors easy to find. An extensive library offers functions from Kernighan and Ritchie and the Lattice PC C compiler. The run-time library produces explicit numbered error messages and a traceback of active function calls if an error occurs.

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SOFTWARE & SERVICES

Languages

Data Language Corp. has ported its **Progress** applications development system to the IBM RT Personal Computer.

According to the vendor, applications written in Progress are immediately portable to the RT PC across Unix, Digital Equipment Corp.'s Ultrix and Microsoft Corp.'s MS-DOS and Xenix. Progress's existing 240 general and vertical applications are also available for the RT PC.

Progress incorporates a fourth-generation language with a relational data base manager.

The full version of Progress for the RT PC costs $4,450.

Data Language, 47 Manning Road, Billerica, Mass. 01821.

Utilities

CFS, Inc. has announced **Release 1.1** of **Helpvtoc** for DOS/VSE and VSE/SP installations.

Helpvtoc is said to provide installations with a series of up to five reports containing detailed information on all of the files in the installation.

Of the five reports, three are for non-VSAM users.

According to the vendor, Helpvtoc combines all non-VSAM with all VSAM data areas in each report.

Helpvtoc costs $1,200 for the original site and $250 for each additional site.

CFS, 1600 V.F.W. Parkway, West Roxbury, Mass. 02132.

Accounting and Computer Technology, Inc. has announced the utility **Trace Job Routing** as well as **Release 3.0** of its **Picture/38** documentation and productivity utility for IBM System/38s.

Picture/38 Release 3.0 schematically presents the complete System/38 operating environment either in print or on the VDT serving to document the system configuration and provide a method of analyzing and identifying errors in subsystem. It includes 11 reports and 11 displays.

Trace Job Routing illustrates how jobs that are set up are going to be routed through the System/38.

Picture/38 costs $500 including Trace Job Routing. Trace Job Routing alone costs $250.

Accouting and Computer Technology, Suite 660, 6510 Abrams Road, Dallas, Texas 75231.

Calcomp has announced the bundling of its **3D Projections** software with its **Cadvance** software.

The 3D Projections software is said to provide oblique, isometric and perspective projections based on information in the two-dimensional designs developed on Cadvance.

These are then projected into the Z plane, creating wire-frame drawings, the vendor said.

Cadvance with 3D Projections costs $2,500.

Current Cadvance users can upgrade by adding the 3D Projections package for $195, according to the vendor.

Calcomp, P.O. Box 3250, Anaheim, Calif. 92803.

■

Softworks, Inc. has announced the **VTAM Network Activity Monitor** for users of IBM's MVS.

The monitor is a generalized utility program designed to monitor transmissions between VTAM applications programs such as TSO and CICS and their logical unit session partners.

A feature of the VTAM Network Activity Monitor include the ability to terminate automatically any session for which no message traffic has occurred over a predetermined time span.

It also produces a processing log detailing the status of sessions monitoring over the full time frame of its execution and a summary of the processing performed.

The VTAM Network Activity Monitor is licensed by site at a cost of $7,500.

Softworks, 7700 Old Branch Ave., Clinton, Md. 20835.

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MICROCOMPUTERS

Systems

Codercard, Inc. has enhanced its **modular computer security system,** which can be integrated into any computer network or data communications environment.

Additions to the system include an IBM Personal Computer-based security workstation said to allow central administration of a data security system and multiple-port protectors, each of which supports 16 communications lines for implementation of secure access for a large computer or distributed data processing system.

The security workstation costs $12,500 and includes an IBM Personal Computer XT, 640K bytes of random-access memory, a 10M-byte hard disk, two serial ports, a Codercard security adapter with data encryption, one multiport protector controller and software.

Codercard, Suite 6, 2182 Dupont Drive, Irvine, Calif. 92715.

CORRECTIONS

Micom Systems, Inc.'s Instanet6000 Series 20 Data PABX [CW, Oct. 20, page 110] costs $4,500 for a 34-channel unit. Micom Systems is located at 4100 Los Angeles Ave., Simi Valley, Calif. 93062.

Armor Systems, Inc.'s Excalibur Plus Payroll [CW, Oct. 6, page 126] module runs on IBM Personal Computers and compatibles.

We've Delivered On A Promise That's About To Deliver Much More.

StorageTek's 8380E disk drives: double capacity, dual-ported and delivered on schedule.

In April of 1985, the new StorageTek made its first public promise: a double capacity, field-upgradable extension of our highly successful 8380 disk drive.

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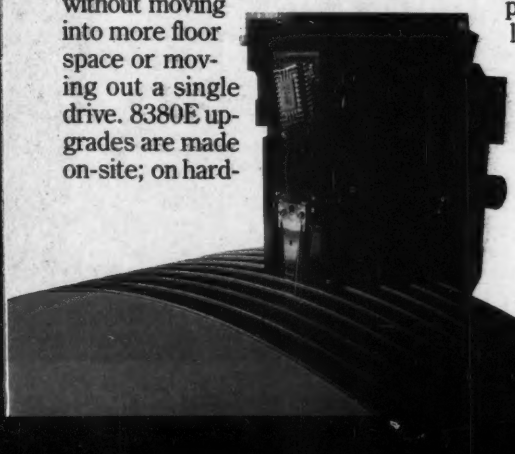
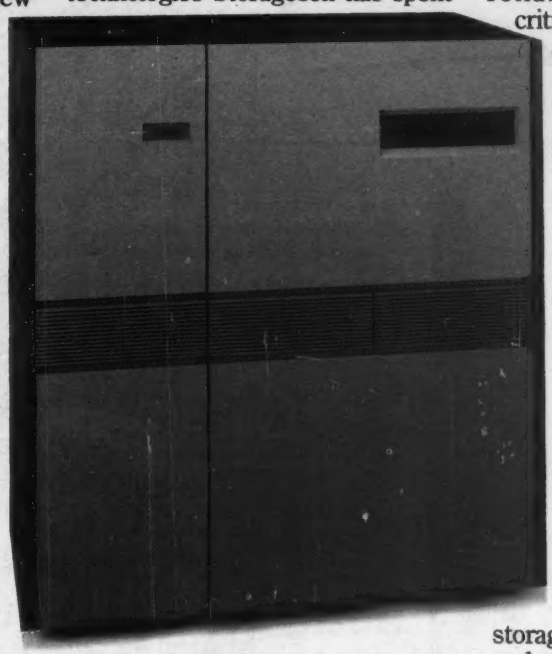
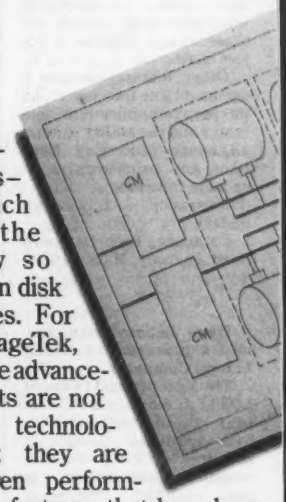
Double capacity without doubling floor space, power or aggravation.

Every StorageTek 8380 customer can now double capacity without moving into more floor space or moving out a single drive. 8380E upgrades are made on-site; on hardware our customers already own.



For new and present customers alike, however, the foundations of 8380E capacity gains come from technologies StorageTek has spent years pioneering and perfecting. These include dual porting (multiple data paths which allow users to lower response times and boost system utilization) and thin-film head design, dual actuators per spindle, distributed electronics, circuit redundancy and continuous self-diagnostics—all of which increase the reliability so critical on disk drives. For StorageTek, these advancements are not new technologies; they are proven performance features that have been part of StorageTek's disk development for many years.





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StorageTek

Storage Technology. It's More Than Our Name... It's Our Commitment.

Storage Technology Corporation Louisville, Colorado 80028-0001

Datacube, Inc. has introduced **Maxvision AT-1**, a mouse-driven, menu-based image processor that plugs into the IBM Personal Computer AT, the Hewlett-Packard Co. Vectra and compatibles.

The system is said to acquire, display and manipulate video images captured from standard television cameras. The software features real-time image integration; near real-time image convolutions, erosions and dilations; histograms; region of interest selective processing; temporal filters; selectable image thresholding; brightness slide; stretch and squeeze; and analysis of object attributes.

Other features include a command line interpreter, an interactive applications generator and the ability to store all image processing functions and primitives as C-callable functions.

Maxvision AT-1 costs $9,500.

Datacube, Four Dearborn Road, Peabody, Mass. 01960.

■

Wang Laboratories, Inc. has announced the **Wang Laptop Computer**.

The laptop is said to weigh 14¼ lb. It features a full-size LCD screen, built-in 10M-byte hard-disk storage, a full-size keyboard, built-in communications and printer and seamless IBM/Wang compatibility using the Microsoft Corp. MS-DOS 3 2 operating system.

Other features include 512K bytes of random-access memory, the choice of two Hayes Microcomputer Products, Inc.-compatible internal modems and IBM color graphics adapter compatibility.

The Wang Laptop Computer is priced at $3,530.

Wang Laboratories, One Industrial Ave., Lowell, Mass. 01851.

Software applications packages

RMS Technology, Inc. has introduced **Estimate**, a cost estimating and inventory management system that runs on IBM Personal Computers and compatibles.

Estimate is said to provide users with cost estimates, formal proposals and inventory control for either custom jobs or volume applications. Estimates are stored and recalled by description, job name or number. Extensions and totals are said to be automatic.

The software prints costing summaries, custom proposals, sorted pull sheets and purchase orders.

Estimate is priced at $295. With the optional inventory module, it costs $395.

RMS Technology, 9680 S. Gribble Road, Canby, Ore. 97013.

Creighton Development, Inc. has announced **Finance 10**, a series of 10 random-access memory-resident financial utility programs.

The utilities are said to pop up instantly from the back group of application programs such as Lotus Development Corp.'s 1-2-3, Ashton-Tate's Dbase III and other Microsoft Corp. MS-DOS-based programs. Each Finance 10 module can export and import data from application programs.

The modules include Load Amortization; ACRS Depreciation, ITC and Section 179; Lease vs. Purchase Analysis; Present Value/Future Value Calculator; Financial Managers Rate of Return; Individual Retirement Account Calculator; Personal Financial Statement; Bond Yield to Maturity; Internal Rate of Return; and Statistics.

Finance 10 costs $149.

Creighton Development, Suite 106, 16 Hughes St., Irvine, Calif. 92718.

Taxcalc Software, Inc. has announced a version of its **Tax Planner** template said to incorporate the changes of the Tax Reform Act of 1986.

The Tax Planner is said to allow users to plan clients' expenditures and income.

Users can move financial information between the years to speculate on possible results.

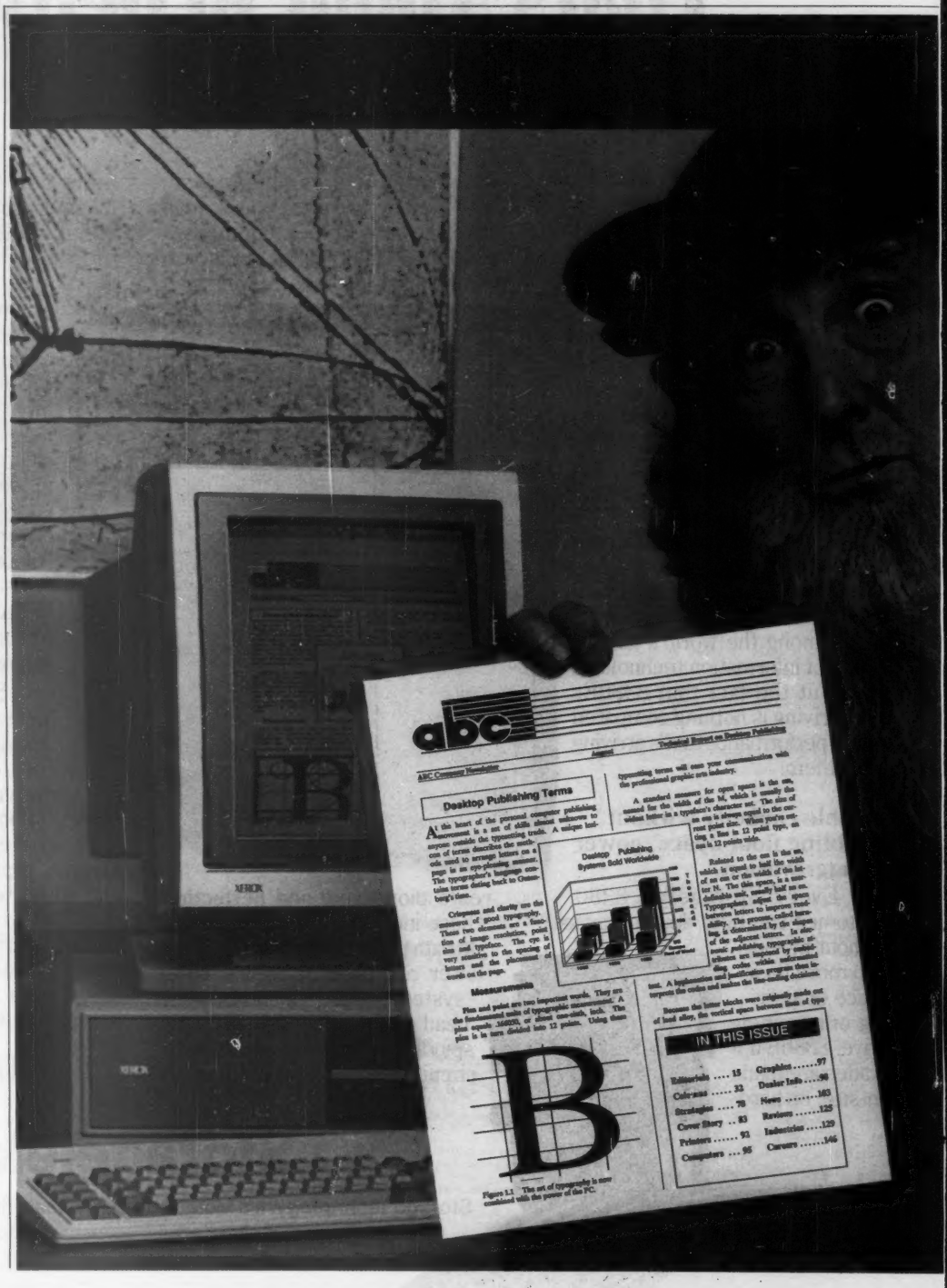
The Tax Planner works with Lotus Development Corp.'s 1-2-3, Symphony and other spreadsheets, the vendor said.

It runs on IBM Personal Computers and compatible systems.

The template includes all tax law changes for 1986, 1987 and 1988.

The Taxcalc Tax Planner for 1986, 1987 and 1988 costs $250. Current users can upgrade for $150, the vendor said.

Taxcalc Software, 4210 W. Vickery Blvd., Fort Worth, Texas 76107.



NEW PRODUCTS/MICROCOMPUTERS

Computervision Corp. has introduced **Microdraft**, a two-dimensional personal computer drafting module for the Personal Designer system.

Features include local coordinate systems, automatic dimensioning, association of nongraphic and geometric information and a set of feature control symbols.

According to the vendor, other attributes include on-screen color icons that can be edited, geometry input methods, a macro programming language and compatibility with the vendor's Microcadds three-dimensional design software.

Microdraft runs on IBM Personal Computers and compatibles, Hewlett-Packard Co. Vectra, NEC Corp. APC IV, Zenith Data Systems Corp. 241 and the Sperry Corp. PC/IT.

It is priced at $2,400.

Computervision, 100 Crosby Drive, Bedford, Mass. 01730.

Base-Two Investment Systems, Inc. has announced **Maxport**, a family of four portfolio analysis systems and three financial data bases that run on the IBM Personal Computer or compatibles.

The three financial data bases include U.S. securities, indices and international securities, according to the vendor.

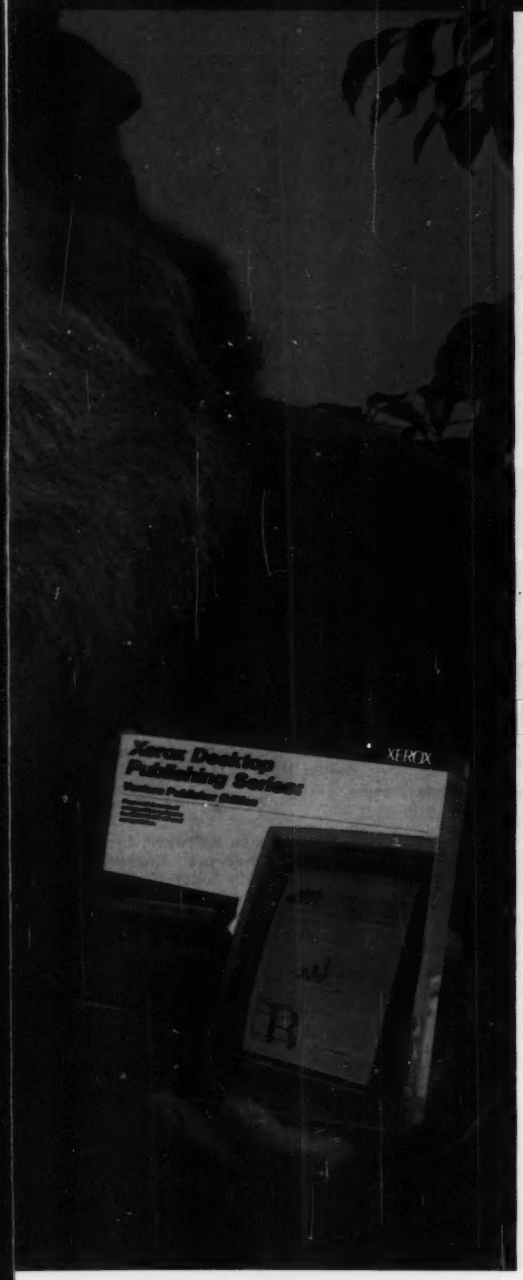
The four portfolio analysis systems of Maxport include the asset allocation system, the beta system, the sector system and the tracking system.

Used in any combination with the three data bases, the portfolio analysis systems are said to allow users to create a mix of securities in an efficient portfolio.

Maxport is available on an annual subscription basis ranging from $5,000 to $35,000.

Base-Two, Third Floor, Six Faneuil Hall Marketplace, Boston, Mass. 02109.

XEROX



Now, desktop publishing software of such genius, you don't have to be a 'Leonardo' to use it.

Until now, if you were in the IBM PC world and wanted to join the desktop publishing revolution, the software was hard to use, expensive, and often rewarded you with documents that were technically correct, yet visually disappointing.

Enter Xerox genius for creating perfect documents and a new generation of desktop publishing software—Xerox Ventura Publisher. It combines the best of current page-oriented systems with the best of document-oriented systems to make desktop publishing easy as well as productive.

The special genius of Xerox Ventura Publisher is "stylesheets"—20 built-in formats that arrange text and graphics automatically. Choose a stylesheet (or create your own), combine your text and graphics, and Xerox Ventura Publisher goes to work at the amazing rate of 20,000 characters per second, formatting as many as 64 100-page chapters. Most other programs format a page at a time, just like the cut-and-paste process you're escaping.

It's easy. You manipulate text and graphics with a mouse. What you see is what you get when you print. (Buy a new Xerox full-page display, and you won't have to scroll to see your entire page layout.) Make a change on page 1 and before you can say "Leonardo da Vinci," the entire document reformats. Tables of contents, indexing and numbering of pages, sections, tables, captions and figures are automatic.

Unlike most other programs, Xerox Ventura Publisher runs on a standard IBM PC XT/AT or compatible—AT power is not required. Text can be created on, and converted from, most major word processing programs. Graphics can be imported from many graphics and paint programs—even scanned images are easily incorporated. It supports dot matrix, color ink jet and laser printers as well as PostScript printers and typesetters.

TeamXerox

What price genius? The money you'll save by producing your very first 16-page booklet instead of sending it out will probably cover the cost of your very own Xerox Ventura Publisher software.

Xerox brings out the genius in you.

Xerox Corporation, P.O. Box 24, Rochester, NY 14692. 143B

Begin your career as a desktop publishing "Leonardo" by stopping in at any computer store featuring Xerox desktop publishing software, by calling your local Team Xerox sales office or 1-800-TEAM-XRX, ext. 143B.

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POSTSCRIPT® is a trademark of ADOBE SYSTEMS.

Software utilities

MCBA, Inc. has introduced **Report Writer with Data Bridge**, written in Ryan-McFarland, Inc.'s RM-Cobol.

The package runs on NCR Corp. Tower and AT&T 3B2 under Unix; Concurrent Computer Corp.'s Xelos; Altos Computer, Inc.'s 486/586/986/2086; and IBM Personal Computer AT under Microsoft Corp.'s Xenix and IBM Personal Computer XTs under IBM PC-DOS or Microsoft MS-DOS.

The Report Writer writes programs that produce custom reports and screen displays using data from MCBA's data files.

According to the vendor, it can bridge report data to applications packages with the Display Information Format, SYLK and ASCII delimited formats.

The Report Writer is priced from $1,500 to $4,500.

MCBA, 425 W. Broadway, Glendale, Calif. 91204.

Software enhancements

Lang-Allan, Inc. announced **Version 2.0** of **Bluestreak Plus**, a communication software package for the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatibles.

Bluestreak Plus is said to combine personal computer-to-personal computer and personal computer-to-mainframe communications.

According to the vendor, the memory-resident program features an interface to application software languages, a trigger into Microsoft Corp. MS-DOS functions and a selection of 13 different terminal emulations.

Bluestreak Plus costs $89.95.

Lang-Allan, Suite B, 2457 Aloma Ave., Winter Park, Fla. 32792.

■

Aldus Corp. has announced **Version 2.0** of its **Pagemaker** desktop publishing application for the Apple Computer, Inc. Macintosh.

Version 2.0 features kerning, automatic hyphenation and justification, as well as support for larger documents.

According to the vendor, the program permits integration of text and graphics. It includes a built-in text editor and allows proportional scaling and cropping of graphic elements.

Additional attributes of the publishing program include multiple type faces and styles, variable type sizes and line spacing and a library of graphic elements.

Pagemaker Version 2.0 costs $495.

Aldus, Suite 200, 411 First Ave. S., Seattle, Wash. 98104.

Communications

Intercontinental Microsystems has announced the **Z-100 node**, a protocol conversion mode designed to link Zenith Data Systems Corp. computers with other personal computers.

The Z-node includes LANS100 and Turbo-DOS operating software and was designed with personal computer configuration hardware.

The node costs $595.

Intercontinental Microsystems, 4015 Leaverton Court, Anaheim, Calif. 92807.

■

Datamate Co. has announed **Dif-Link**, software designed for NCR Corp.'s ITX interactive computer.

The package integrates spreadsheet, data base and report-writing functions with data transfer and terminal emulation capabilities.

The user can exchange information among ITX data files, personal computer-based applications and the system's own data base and spreadsheet functions.

Dif-Link is priced at $4,000.

According to the vendor, options include data dictionary setup, priced at $250, and additional personal computer access priced at $200 each.

Datamate, Suite 128, 4135 S. 100th East Ave., Tulsa, Okla. 74146.

■

The Software Link, Inc. has announced **PC Emulink**, terminal emulation software for IBM Personal Computers and compatibles.

PC Emulink is said to allow users to operate single floppy disk drive personal computers as if they were color graphic terminals sharing the resources of a more powerful personal computer.

PC Emulink has automatic dial-up facilities for remote modem access to network resources. The software is compatible with Multilink Advanced and Lanlink, the vendor's shared processor and networking software.

PC Emulink is priced at $199.

The Software Link, Suite 632, 8601 Dunwoody Place N.E., Atlanta, Ga. 30338.

■

Polygon Associates, Inc. has announced **Poly-Star**, a personal computer-to-Digital Equipment Corp. VAX communications software package.

Poly-Star is said to provide emulation of the latest models of DEC's text terminals, seamless file transfer capabilities, pop-up window menus, hot-key switching, international keyboard support, enhanced remote control features and smart modem support.

Other attributes include a phone book feature, a user-programmable communication language and prewritten communications language programs for automated logon, file transfer, disk backup and mail delivery.

Poly-Star is priced from $200.

Polygon Associates, 1024 Executive Pkwy., St. Louis, Mo. 63141.

■

Cable & Wireless Carterfone has announced **Reachfax**, a personal computer-oriented data and facsimile device.

Reachfax is a combination hardware and software product said to enable a personal computer to send and receive a Group III facsimile from any Group III fax machine or similarly equipped personal computer.

Features include the ability to menu-select the type of message to be sent, data or fax, and the desired method of sending.

Also included are an applications manager, dialing director, error-protection protocols and data modem controller from 300 to 19.2K bit/sec.

Reachfax is priced at $1,195.

Cable & Wireless Carterfone, West Tower, 1341 W. Mockingbird Lane, Dallas, Texas 75247.

■

Zoom Telephonics has released a 2400 bit/sec. version of its **Zoom/Modem PC 1200**.

Features of the modem include call progress tone detection, demon dialing of busy numbers, audio input and output ports, support for four COM ports and a 16450 Universal Asynchronous Receiver/Transmitter for compatibility with IBM Personal Computer AT compatibles.

The modem incorporates the Rockwell International Corp. 2,400 bit/sec. chip set and supports AT&T and CCITT full-duplex standards.

The Zoom/Modem PC 2400 is priced at $249.

Zoom Telephonics, 207 South St., Boston, Mass. 02111.

■

Great Plains Software, Inc. has announced **Network Manager**, a software module designed to provide multiuser capabilities for the Great Plains accounting series using a local-area network.

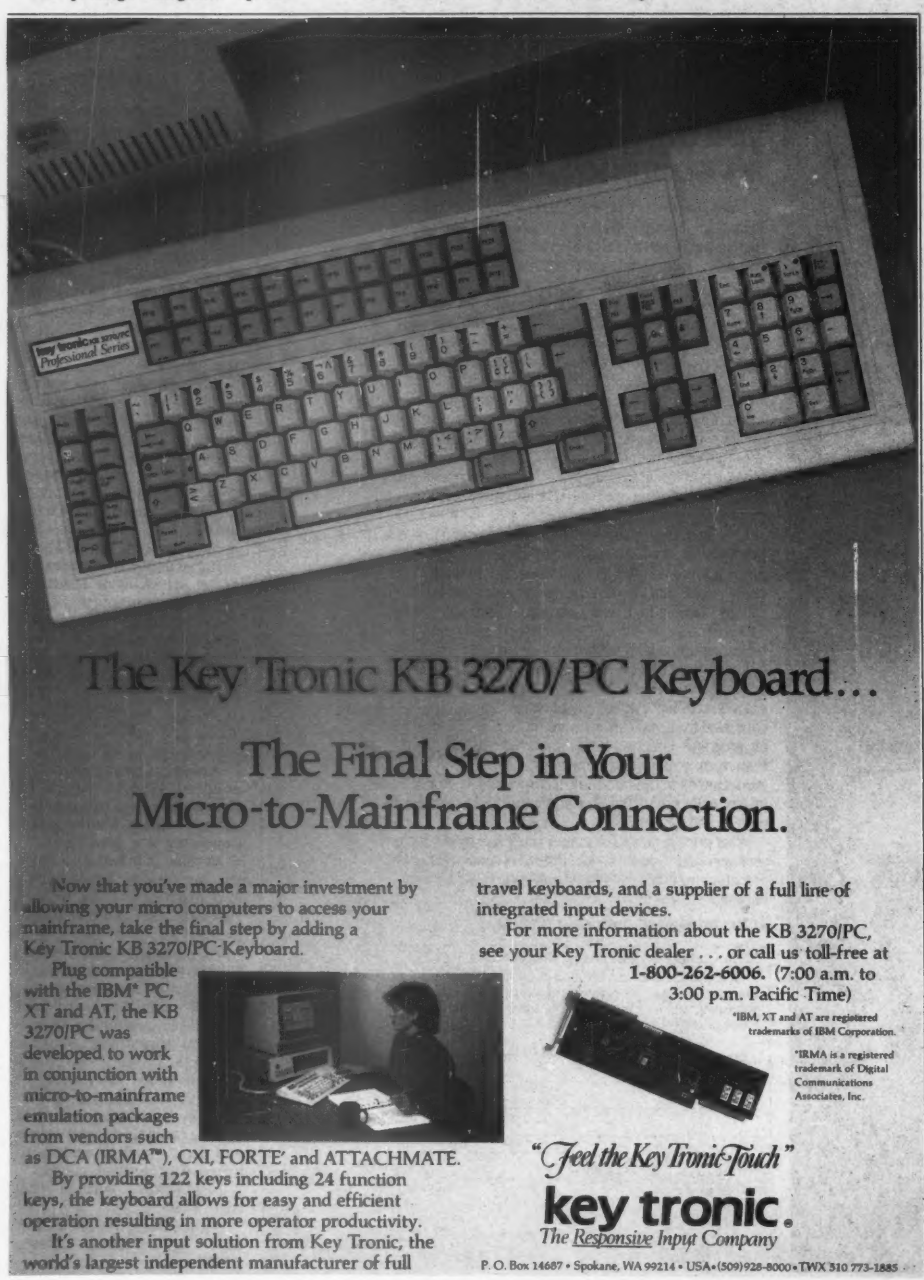
Features of the software module include program-, file- and record-level lockout; support for a cash drawer, bar code reader and printer at each workstation.

According to the vendor, other attributes of the modem include multiple file servers, a status screen, password protection and on-line help.

The Network Manager module costs $395 for up to six workstations and $50 for each additional workstation.

The other modules in the accounting series are priced from $395 to $695 apiece.

Great Plains Software, 1701 S.W. 38th St., Fargo, N.D. 58103.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Proteon, Inc. has announced **The Token-Ring Monitor** and **Token-Ring Analyzer,** IBM Personal Computer-based management systems for its 10M bit/sec. Pronet-10 local-area network.

The Token-Ring Monitor consists of a single-board software package of management and diagnostic tools. The Token-Ring Analyzer consists of a three-board software package that can capture up to 5,000 data packet/sec. to provide statistics.

The Token-Ring Monitor is priced at $1,200, and the Token-Ring Analyzer costs $4,900.

Proteon, Four Tech Circle, Natick, Mass. 01760.

■

United Software Industries, Inc. has announced **ASCII Express Mousetalk,** a mouse-based telecommunications software package for the Apple Computer, Inc. Apple GS, Apple IIe and Apple IIc.

Mousetalk utilizes a Macintosh-like user interface featuring pull-down menus, a built-in visual text editor and a macro system. It also offers terminal emulation, accommodates data transfer speeds to 19.2K bit/sec. and is compatible with most external modems, the vendor said.

The ASCII Express Mousetalk package is priced at $149.95.

United Software Industries, Suite 200, 8399 Topanga Canyon Blvd., Canoga Park, Calif. 91304.

Data storage

Micah, Inc. has announced the **Micahdrive 30 XT,** a hard disk for the Apple Computer, Inc. Macintosh.

The Micahdrive 30 XT is an external 30M-byte hard disk drive. It attaches to the Macintosh Plus by the small computer system interface connector.

According to the vendor, it transfers data to and from the Macintosh random-access memory at 0.47M bit/sec.

The disk transfer rate is reportedly 7.5M bit/sec., and the interleave sector is 2 to 1.

The Micahdrive 30 XT costs $1,395.

Micah, Suite 111, 2330 Marinship Way, Sausalito, Calif. 94965.

■

Maynard Electronics has announced **Maynstream Plus 20/20,** a combination portable tape backup and hard disk drive.

The Maynstream Plus 20/20 is composed of a half-height 20M-byte hard disk drive with a 20M-byte half-height Maynstream tape backup.

Maynstream Plus is said to back up 20M bytes file by file onto a 4- by 2½-in. cassette.

It has a file splitting capability that allows users to put data on a second or third cassette, according to the vendor. The Maynstream Plus controller card occupies one slot in a personal computer.

The unit and controller card costs $2,400 for the IBM Personal Computer and PC XT version and $2,200 for the PC AT.

Maynard Electronics, 460 E. Semoran Blvd., Casselberry, Fla. 32707.

■

The Software Labs Division of Sterling Software Co. has announced **Intelligent Backup,** a hard disk data management system for the IBM Personal Computer and compatibles.

Intelligent Backup includes prompting, multiple device support and the ability to back up only those files that have been altered.

Other features include an IBM PC-DOS command interface, a full-screen editor and a Help function, according to the vendor.

In addition, Intelligent Backup provides the user with information on the number of diskette files that will be needed. The product also provides users with an estimate of the time required to perform the copying function.

Intelligent Backup is priced at $149.95.

VAMCO, 10310 Markinson Road, Dallas, Texas 75238.

Printers/Plotters/Peripherals

Tatung Company of America has announced the **Model MM-1422** 14-in., high-resolution, dual-frequency monochrome monitor.

The unit is IBM Personal Computer compatible. It features a tilt-and-swivel base and front controls.

Designed for use as an alphanumeric and graphic display device, it offers horizontal scanning at the self-adjusting rate of 15.75 kHz for Compaq Computer Corp. use and 18.43 kHz for IBM use.

Resolution is 800 by 350 dot/in. in 18.43-kHz mode and 640 by 200 dot/in. in 15.75-kHz mode.

The monitor is priced at $269, according to the vendor.

Tatung, 2850 El Presidio St., Long Beach, Calif. 90810.

Texas Instruments, Inc. has added the **Model 885** and **Model 885 AT** to its Omni 800 family of systems printers.

Both dot-matrix printers feature zero tear-off capability and front paper feed.

They can accommodate paper widths of 3 to 9½ in. and print forms up to five parts. They offer a 300 char./sec. draft-print mode and a 75 char./sec. enhanced mode.

The Model 885 has serial and parallel interface standard. The Model 885 AT is hardware and software compatible with the IBM Personal Computer AT, XT and compatibles, the TI Business-Pro Computer and the TI Professional. It also comes with serial and parallel interfaces.

Both Models are priced at $2,295.

Texas Instruments, P.O. Box 809063, H-893, Dallas, Texas 75380.

INTRODUCING

INTELLECT/DB2

USING AI TO DELIVER DB2 TO MANAGEMENT

INTELLECT/DB2 dramatically enhances your investment in DB2 by making it accessible to managers in plain English. INTELLECT/DB2 was developed by Artificial Intelligence Corporation, the pioneer in commercial AI technology and the creator of INTELLECT, the natural language software used by hundreds of organizations worldwide.

Attend a free seminar and learn the six requirements for delivering DB2 to management.

1. NATURAL LANGUAGE
INTELLECT/DB2 allows managers to ask questions of a DB2 database in English. Its advanced AI techniques allow users to request information in any way. It understands ambiguous questions, and lets managers use their own vocabulary, which it learns as it's used.

2. AD HOC ANALYSIS
INTELLECT/DB2 enables managers to get answers to complex questions easily. Statistics such as totals, minimums, maximums and percentages, and complex functions including correlations and ratios need only be requested. Users see results displayed in summary form or graphs automatically.

3. APPLICATION BUILDING
INTELLECT/DB2 users can build personal applications in English. Within security constraints, users can create and update tables, build forms for data presentation, and request reports.

4. PROPER USE OF DB2
INTELLECT/DB2 uses all DB2 capabilities to the system's advantage. And as a SQL generator, INTELLECT's interface to DB2 takes full advantage of DB2's power.

5. OPEN ARCHITECTURE
INTELLECT/DB2 users employ DB2 or other databases and file structures in many ways. With INTELLECT's PC Link, they ask questions on a PC, have the results from DB2 reformatted into a Lotus 1-2-3 worksheet, and sent down to a PC. And, advanced work in AI provides voice input to your DB2 database.

6. THE RIGHT VENDOR SUPPORT
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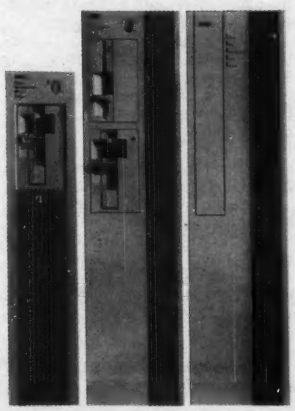
The NCR Tower.™

Texas has the second largest number of licensed drivers in the country. To speed up traffic in its statewide licensing offices, the Lone Star State installed eighty Towers.

Airborne Express, the overseas delivery service with the sky-high growth record, employs a network of Towers in the Far East to keep track of thousands of international shipments every day.

Obviously, the Tower is a very versatile computer.



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The NCR Tower is actually a family of computers, ranging from a 2-4 user system to a departmental system. Or from a small business network to an international network of hundreds of users. Memory capacity ranges from one to sixteen MB. And for disk storage, from 25 MB to over 5.5 gigabytes. Networking and communications are easy because the Tower supports all major protocols, including SNA, X.25.

The NCR Tower offers a choice of operating systems: UNIX System V* and RM/COS.* And every Tower is designed with open systems architecture to work with industry standard hardware and software.

What's more, NCR backs the Tower with one of the world's largest service organizations. With 16,000 engineers on call, expert NCR service is as close as the phone. Which is another reason the Tower is a smarter choice. And why smart businesses have already chosen more than 22,000 NCR Towers.

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NEW PRODUCTS/MICROCOMPUTERS

Interactive Computer Products, Inc. has announced the **Genius Tablet**, a digitizing tablet for IBM Personal Computers and compatibles.

The tablet features a magnetic induction technique, resolution to 1,000 line/in. and a three-button cursor control device.

The product connects to the microcomputer via a standard RS-232C interface and can automatically scale the output to match any CRT resolution.

In addition, the transfer mode is program selectable and can occur in either point, streaming and cursor switch-controlled streaming mode, according to the vendor.

The Genius Tablet is priced at $795.

Interactive Computer Products, Suite 180, 23591 El Toro Road, El Toro, Calif. 92630.

Tatung Company of America has announced an IBM Personal Computer-compatible, 13-in., red-green-blue color monitor called the **CM-1365.**

The monitor features a multicolor display with a five-position switch for green, amber, color, paper white and reverse blue. It also features front control for text mode, brightness and contrast and power.

The horizontal scan frequency is 15.75 kHz, and the vertical scan frequency is 50Hz to 60Hz. The resolution is 640 by 200 pixels.

The monitor is priced at $595.

Tatung, 2850 El Presidio St., Long Beach, Calif. 90810.

■

International Data Acquisition and Control, Inc. has announced the **IDAC/1000**, a data acquisition peripheral that works with IBM and Apple Computer, Inc. Macintosh personal computers.

The IDAC/1000 operates over a standard RS-232 port at speeds up to 19.2K bit/sec. It has a 32K-byte firmware operating system and is said to be able to capture eight channels of a single-ended analog input or four channels of differential analog input. Up to 16 channels of digital I/O are jumper selectable for input or output in groups of eight.

A fully operational hardware unit costs $995.

Complete system packages including data acquisition software and cable connection for use with an Apple Macintosh or the IBM Personal Computer cost $1,795.

International Data Acquisition and Control, P.O. Box 397, Four Limbo Lane, Amherst, N.H. 03031.

■

Talaris Systems, Inc. has enhanced its **Talaris 810** laser printer.

The random-access memory for fonts and overlays has increased from 78K bytes to 176K bytes, allowing storage of eight fonts. In addition, the memory allocated to graphics has doubled, from 128K bytes to 256K bytes, permitting a minimum of 22 square inches of 300 dot/in. images on each page.

The Talaris 810 supports a data compression scheme that permits larger graphics to be printed at full resolution by condensing the data for large white or black areas.

The enhanced Talaris 810 is priced at $3,450.

Talaris Systems, P.O. Box 261580, 5160 Carroll Canyon Road, San Diego, Calif. 92126.

■

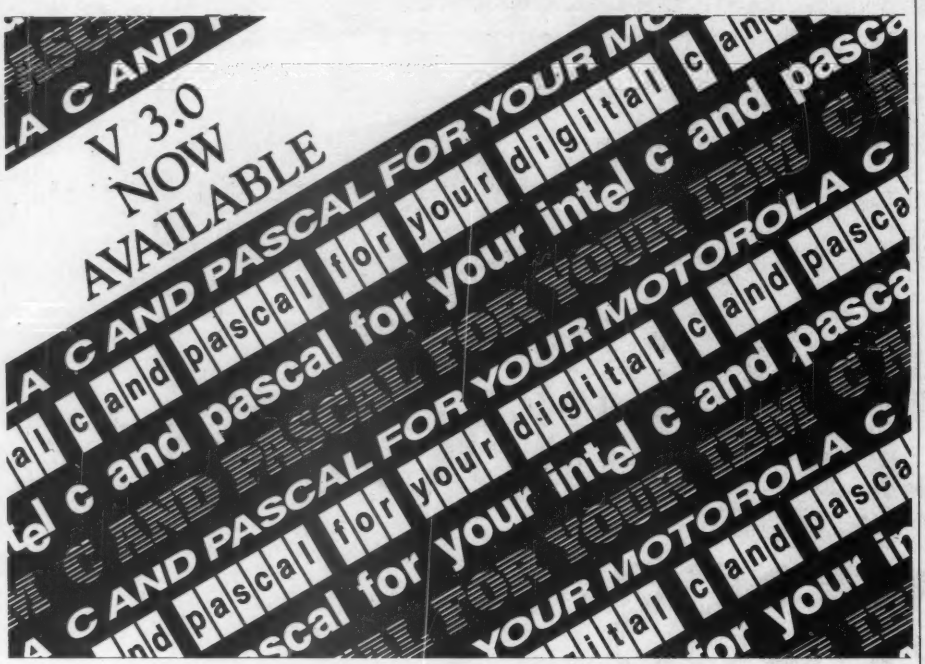
Datacopy Corp. has announced that its **Jetreader** page-feed scanner and **Model 730** flatbed scanner are available for the Apple Computer, Inc. Macintosh.

Both systems are said to provide 300 dot/in. or 200 dot/in. resolution. They can capture images of up to 8½ by 11 in. Once-scanned images can be formatted for insertion into documents prepared on desktop publishing programs.

Datacopy's Macimage software controls the scanner, manages and prints image files and views images.

The Jetreader system with Macimage and interface cables costs $2,250. The Model 730 costs $3,250.

Datacopy, 1215 Terra Bella Ave., Mountain View, Calif. 94043.



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NEW PRODUCTS/MICROCOMPUTERS

Enter Computer, Inc. has announced the **SP1000**, a computer-aided design wide-bed plotter for use with IBM Personal Computers.

The plotter is said to be compatible with the Hewlett-Packard Co. Graphics Language.

It is continuously adjustable for paper sizes A to D, operates at 24 in./sec. and operates with software design packages such as Autodesk, Inc.'s Autocad.

The SP1000 plots on bond, vellum or film media and has a full-function keyboard, the vendor said.

The SP1000 plotter is priced at $3,995.

Enter Computer, 6867 Nancy Ridge Drive, San Diego, Calif. 92121.

Board-level devices

Quadram Corp. has announced the **QuadEGA Prosync**, a high-resolution, advanced graphics adapter for multisynchronous monitors.

The card is said to emulate six video display modes. It supports IBM's Monochrome Display Adapter, Color Graphics Adapter and Enhanced Graphics Adapter display modes as well as the Hercules Computer Technology, Inc. Graphics Card mode. It also supports 640- by 480- and 752- by 410-pixel resolution and comes with a driver that permits Microsoft Corp. Windows to run in the higher resolution modes.

The QuadEGA Prosync is compatible with the IBM Personal Computer, Personal Computer XT, PC AT and compatibles and is priced at $595.

Quadram Corp., One Quad Way, Norcross, Ga. 30093.

■

The Persyst Division of Emulex Corp. has announced the **EG-8**, a graphics expansion, multifunction card said to emulate the IBM Enhanced Graphics Adapter (EGA).

The card is said to provide eight functions on one board for use with IBM Personal Computers, Personal Computer XTs and PC ATs. It provides support for IBM's EGA, Color Graphics Adapter and Monochrome Display Adapter in addition to providing a serial port, bidirectional parallel port, a calendar and clock, lightpen interface and random-access memory disk.

The EG-8 board is priced at $599.

Persyst, 3545 Harbor Blvd., P.O. Box 6725, Costa Mesa, Calif. 92626.

■

Adage, Inc. has announced the **PG 90 Model 10** and the **PG 90 Model 20** board-level graphics products for the IBM Personal Computer AT.

The Model 10 is a 1,280- by 1,024-pixel resolution, very large-scale integration-based graphics processor board. It offers color graphics and a 2,048- by 1,024-pixel frame buffer. It is available in four- and eight-plane configurations.

The Model 20 is a two-board set that combines the features of the Model 10 with a processor board, including 64K bytes of read-only memory and 256K bytes of random-access memory. The single-unit price of the Model 10 configuration is $2,895. The eight-plane version costs $3,495. The Model 20 four-plane model costs $4,895, and the eight-plane model configuration costs $5,495.

Adage, One Fortune Drive, Billerica, Mass. 01821.

Modgraph, Inc. has announced the **Model 3152 Prism** graphics controller for IBM Personal Computers and compatibles.

The Prism offers resolution of up to 1,024 by 780 pixels with a choice of 16 colors from a palette of 4,096. It also supports 16 levels of gray scale for monochromatic graphics applications.

Primitives are provided for line, arc, circle and rectangle as well as hardware Zoom and Pan functions. An RS-232 port is standard for connection of a mouse, digitizer, printer or another host processor. An RS-343-A red-green-blue video output is jumper-selectable for the Model 3152 Prism, according to the vendor.

The Model 3152 Prism costs $1,695.

Modgraph, 56 Winthrop St., Concord, Mass. 01742.

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Based on the 16-bit Intel 80286 microprocessor, the Tandy 3000 HD (25-4001) operates at 8 megahertz for high-speed performance. The Tandy 3000 HD features 640K main memory and a 5¼" slim-line floppy disk drive designed to read both 1.2-megabyte and 360K formats. This allows it to run either IBM PC/AT or IBM® PC software.

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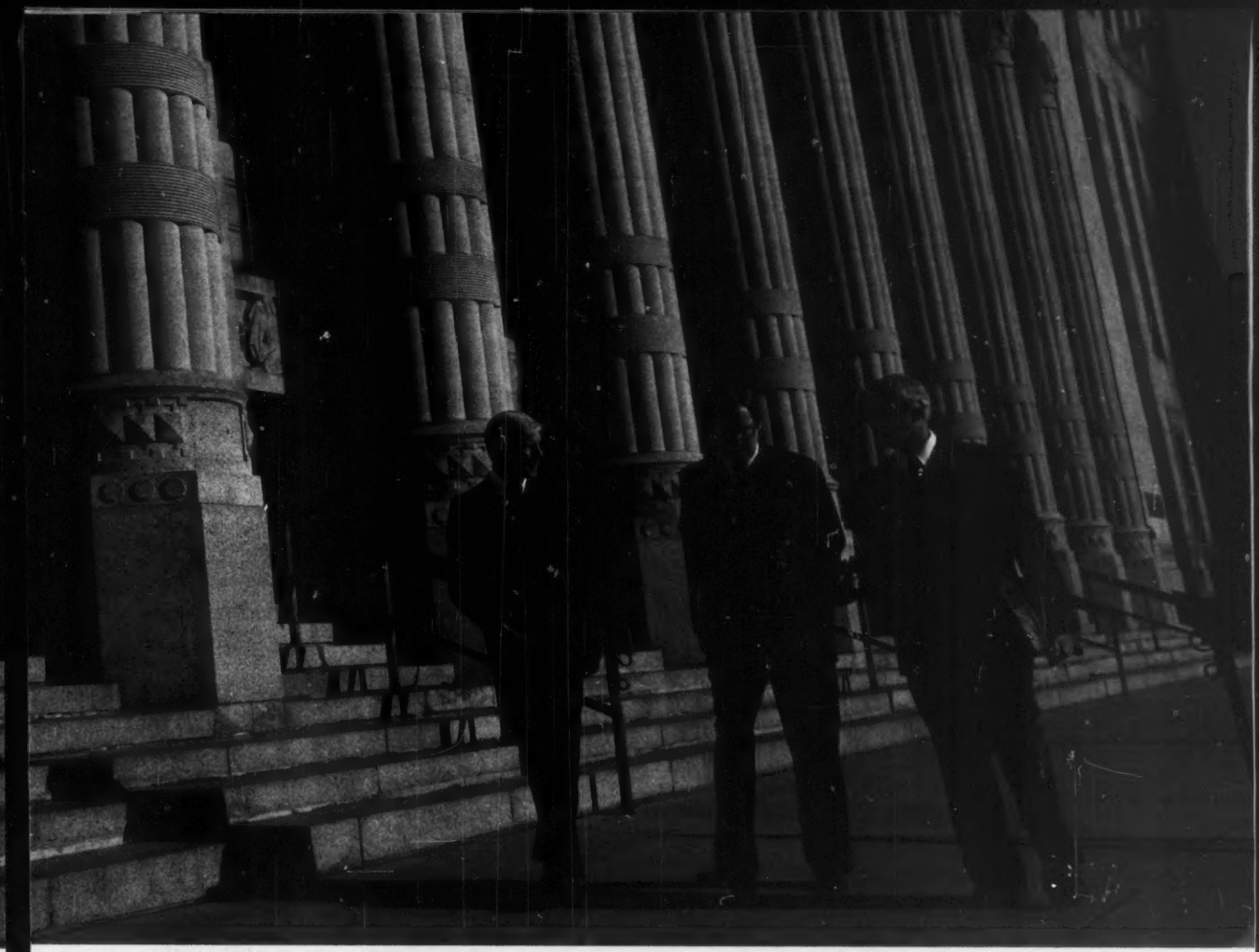

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The Director of Data Processing, John Zebracki adds, "By maximizing access to our central files, we manage the use of PCs, and at the same time streamline operations in such critical departments as Fire, Police, Water, Engineering, Collections, and Inspections."

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NEW PRODUCTS/MICROCOMPUTERS

Wespercorp, Inc. has introduced the **DC-8000** multifunction controller for personal computers and compatibles.

The controller combines a storage module drive (SMD) controller with a small computer systems interface (SCSI) host adapter on a standard-size IBM Personal Computer board. It supports on-board data transfer between SMD and SCSI devices.

The SMD portion supports simultaneous connection of any two disk drives with up to 2.5M bit/sec. transfer rates. The SCSI portion allows connection of up to eight industry-standard SCSI storage peripherals.

The controller comes with a device driver and utility software for Microsoft Corp. MS-DOS 3.0 and up.

The DC-8000 costs $1,715.

Wespercorp, 1821 E. Dyer Road, Santa Ana, Calif. 92705.

Ahead Systems, Inc. has announced the **EGA2001** multimode graphics card and the **EGA2001/Plus** graphics card for IBM Personal Computers and compatibles.

The EGA2001 is said to deliver hardware and software compatibility with the IBM Enhanced Graphics Adapter, the IBM Color Graphics Adapter, the IBM Monochrome Display Adapter and the Hercules Computer Products Graphics Card.

The EGA2001/Plus adds 720 by 396 pixel all-point addressable 16-color graphics; 640 by 480 pixel graphics with a choice of 16 colors from a palette of 64; IBM 3278/79 terminal emulation display support; and support for desktop publishing.

The EGA2001 costs $399. The EGA2001/Plus costs $599.

Ahead Systems, Suite B105, 1977 O'Toole Ave., San Jose, Calif. 95131.

Texas Instruments, Inc. has added an **Enhanced Color Display** (ECD) System to its list of options for the TI Business-Pro computer family.

The ECD System includes the TI Enhanced Video Adapter card and the Enhanced Color Display unit that is said to be compatible with the IBM enhanced graphics products.

Also included are a 13-in. screen with 640 pixel by 350 pixel resolution and a palette of 64 colors, any 16 of which can be displayed at one time.

The ECD System can be used as a high-resolution, IBM Personal Computer AT-compatible monitor or configured with the Pro-Cad 286 computer-aided design models.

The ECD System is priced at $1,695.

Texas Instruments, P.O. Box 809063, H-886, Dallas, Texas 75380.

Standard Microsystems Corp. has introduced the **SMC4004-PC** half-slot surface-mounted dual Winchester disk controller board.

The board is said to be plug compatible with IBM Personal Computers and compatibles.

It controls up to two standard Winchester disk drives and provides for data error detection and correction as well as on-board data separation.

According to the vendor, it controls the drives through the ST506 interface.

The SMC4004-PC is priced at $165.

Standard Microsystems Corp., 35 Marcus Blvd., Hauppauge, N.Y. 11788.

■

Persyst has anounced the **SB-III,** an electronic message system memory and I/O expansion board for the IBM Personal Computer and compatibles.

The SB-III is said to offer up to 2M bytes of expanded memory and include serial port, parallel port, calendar/clock and game port interface.

The SB-III adheres to the Lotus/Intel/Microsoft specification for expanded memory and allows the user memory access beyond the 640K-byte DOS limit.

The single board SB-III fits into any long slot.

Software utilities include random-access memory disk emulation and print spooling.

The SB-III board is priced at $399.

Persyst, 3545 Harbor Blvd., P.O. Box 6725, Costa Mesa, Calif. 92626.

■

Practical Peripherals, Inc. has announced the **Practical Multifunction 1200,** an IBM Personal Computer-compatible multifunction card with an on-board modem.

The full-sized card contains a Hayes Microcomputer Products, Inc. compatible 1,200/300 bit/sec. modem with autodial/autoanswer capabilities.

According to the vendor, the multifunction card also features the capacity for up to 512K bytes of random-access memory, print spooler capabilities, two serial ports, a parallel port and a clock/calendar with battery backup.

Other attributes included are two communications software programs, the Pop-Up Deskset Plus desktop organizer from Popular Programs, Inc. and four additional software utilities.

The Practical Multifunction 1200 is priced at $395.

Practical Peripherals, 31245 La Baya Drive, Westlake Village, Calif. 91362.

Auxiliary equipment

T. S. Microtech, Inc. has added the **Wordperfect Dreamer**, the **Developer's Dreamer**, the **Programmable-30 Dreamer** and the **Progammable-50 Dreamer** to its IBM Personal Computer-compatible Dreamer line of function keyboards.

The Wordperfect Dreamer is reportedly dedicated to Wordperfect Corp.'s Wordperfect word processing software.

Wordperfect Dreamer provides more than 60 read-only memory resident functions and features a 20-key numeric keypad with independent

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cursor control.

According to T. S. Microtech, the Developer's Dreamer and the Programmable-30 and -50 Dreamers each feature 50 keys that can be reassigned with the aid of keyboard enhancer software.

The Wordperfect Dreamer function keyboard is priced at $229, and the other function keyboards are priced at $259 each, according to the vendor.

T. S. Microtech, 12565 Crenshaw Blvd., Hawthorne, Calif. 90250.

COMMUNICATIONS

Controllers

Codex Corp. has announced the **Codex 4255 SNA Gateway**, a multifunction cluster controller and protocol converter.

The gateway is said to allow non-Systems Network Architecture (SNA) devices to access IBM SNA hosts over a single Synchronous Data Link Control link.

According to the vendor, it is available for DOS/VSE as well as MVS and MVS/XA environments and comes in both asynchronous and bisynchronous versions.

The device supports direct, leased and dial-up connections for central and remote sites. It extends SNA network management to non-SNA devices and allows users to perform both interactive and batch operations concurrently.

A 16-port asynchronous version is priced at $7,800 and a full-function, four-port version is priced at $7,300.

Codex, 20 Cabot Blvd., Mansfield, Mass. 02048.

Voice/data communications

Compression Labs, Inc. has announced the **Rembrandt Desktop Video System**.

The personal computer-based video communications system is said to allow integration of motion color video, graphics, data and voice between local or remote stations.

Other attributes included are the Rembrandt Video Station with a monitor, camera/speaker module and video station controller with a video coder/decoder.

Video stations interface with IBM Personal Computer local-area networks via a network controller for transmission of video and computer data and with standard private branch exchange telephone systems for voice transmission.

According to the vendor, the system handles up to 64 stations and allows a maximum of 22 to be used simultaneously.

A typical five-video station configuration is priced at about $135,000.

Compression Labs, 2305 Bering Drive, San Jose, Calif. 95131.

■

Octel Communications Corp. has announced the **Woobox**, a device designed to integrate the vendor's Aspen voice/message system with any private branch exchange (PBX) or hybrid key system supporting direct inward dial lines from a central office.

The device is said to automatically provide the Aspen voice/message system with the called party's identity so the caller does not have to reenter the number.

According to the vendor, the Woobox connects to the trunk side of a PBX or hybrid key system. It is available in 8-, 16-, 24- and 32-channel capacities and multiple units may be combined to provide more channels.

The Woobox is priced from $3,850 to $8,800.

Octel Communications, 890 Tasman Drive, Milpitas, Calif. 95035.

Software

Soft-Switch, Inc. has announced **Mailbridge Server/Wang Office**, a software said to link Wang Laboratories, Inc.'s Office to other electronic mail systems including IBM Disoss and Professional Office Systems, Digital Equipment Corp.'s All-In-1 and MCI Communications Corp.'s MCI Mail.

The link is said to allow users of the Wang Office integrated office automation package to exchange memos, phone messages and invitations with users of other Soft-Switch-supported office systems.

According to the vendor, the software is implemented as a Wang VS application using the Wang Office Application Program Interface.

The Mailbridge Server/Wang Office is priced at $18,000 for up to six VS systems connected and $3,000 per VS thereafter.

Soft-Switch, 200 N. Warner Road, King of Prussia, Pa. 19406.

■

NCR Corp. has announced **LU1 printer emulation and LU3 emulation**, Systems Network Architecture (SNA) programs designed to provide industry-standard communications capabilities for users of the Tower microcomputer family.

Both programs provide printing and file transfer capabilities. They allow use of exisiting IBM host applications and resource sharing among Tower printers.

According to the vendor, LU1 permits reception of SNA character string files from an IBM host for printing or processing.

The LU3 emulation software permits the reception of data-string-compatible files for the same purpose.

Both the LU1 and LU3 programs emulate an IBM 3287 printer connected to an IBM 3274 or 3276 display controller.

Each product is priced at $150.

NCR, 1700 S. Patterson Blvd., Dayton, Ohio 45479.

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Leader: Harold C. Folts, Executive Director, OMNICOM Inc.

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T-2 ISDN—Status and Developments

Leaders: James G. Herman, Director, and Mary A. Johnston, Senior Consultant, Telecommunications Consulting Group, BBN Communications

In this tutorial you'll learn what ISDN will and won't deliver in the late 1980s, what the emerging ISDN standards will mean in terms of new services and improved network performance, what holes still exist in the standards and trials, how to make smart buying decisions while keeping open your options for ISDN compatibility, and more. *Level:* Intermediate.

T-3 Strategic Planning for Corporate Information Networks

Leader: Dr. Howard Frank, Howard Frank Associates

Attend this tutorial to learn how to relate vendor offerings and technological trends to your organization's needs and requirements, and to develop a framework to plan future services and systems. You'll examine current issues in network integration, why communication departments must function as "mini telcos," and the pros and cons of software defined networks and private dedicated networks. *Level:* Introductory–Intermediate.

T-4 Planning and Designing Networks with the New Technology

Leader: Dr. John M. McQuillan, President, McQuillan Consulting

In this intensive seminar, you'll get acquainted with the key architectural principles used by today's leading network planners. You'll review emerging technologies such as T-1 networks, hybrids, VSATs, gateways between SNA, LANs and X.25, micro-mainframe links, and intercompany networks. You'll learn how to plan a corporate network using advanced technologies. *Level:* Advanced.

T-5 Building the Network Management and Technical Control Facility

Leader: Gabriel Kasperek, President, Kazcom Inc.

This one-day course will help you understand the strategic value of network control, explore alternative technologies for managing your network, and discover how to evaluate current technologies for use in your own organization. You'll become familiar with the test equipment you need for successful network control, and understand industry trends and future directions. *Level:* Introductory–Intermediate.

T-6 Designing Voice and Data Networks Under the New Tariffs

Leader: Robert L. Ellis, President, The ARIES Group Inc.

Take this tutorial to learn the structure of the post-divestiture tariffs, the latest January 1987 changes to these tariffs, how to price interstate private lines, how to configure and price interstate FX services, the new economics involved in configuring data networks, the LATA-pure strategy, and more. *Level:* Intermediate.

T-7 Managing the Telecommunications Resource

Leader: Gerald P. Ryan, President and Founder, Connections Telecommunications Inc.

This one-day course briefs you on how to develop a successful management environment. You'll learn what tools are available to do your job more professionally, how to plan a network management center, how to staff and train the department, and how to prepare and substantiate departmental budgets. *Level:* Intermediate.

T-8 IBM Token-Ring Versus Other LAN Choices

Leader: Dr. Kenneth J. Thurber, President, Architecture Technology Inc.

This tutorial gives you an across-the-board overview of announced products, future plans, compatible products, and IBM's overall strategy with respect to Token-Ring technology. You'll discuss the Token-Ring's relationship to IEEE 802.5, the IBM cabling systems and hosts, get an in-depth look at NETBIOS and APPC/LU 6.2 interfaces, and more. *Level:* Intermediate.

T-9 VSAT Technology and Implementation

Leader: Dr. Jerome G. Lucas, President, TeleStrategies

Learn the basics of applying very small aperture terminal (VSAT) satellite communications to your networking needs. You'll get acquainted with basic application requirements in SNA networking, data broadcasting, PC networking, video broadcasting, and teleconferencing. *Level:* Intermediate.

T-10 IBM's Systems Network Architecture (SNA): A Detailed Road Map

Leader: Daniel Zatyko, President, Zatyko Associates

Enroll in this intensive one-day tutorial to understand the evolution of SNA, and learn fundamental SNA concepts—the seven SNA architectural layers, SNA's physical and logical addressing, strategic SNA products, components of NetView, Token-Ring networks, functionality and capabilities of the LU 6.2/APPC and NETBIOS interfaces, and more. *Level:* Intermediate.

T-11 An Introduction to Data Communications Today

Leader: Gary Audin, President, Delphi Inc.

This course introduces you to the basic concepts, terminology and technology of data communications. You'll learn how various networks operate and how to select them; how best to interconnect computers, terminals, and PCs using different protocols; and what software is necessary to support protocols and network management. *Level:* Introductory.

T-12 Understanding the Communications Regulatory Environment

Leader: Richard E. Wiley, Senior Partner, Wiley, Rein & Fielding

Enroll in this tutorial to learn how telecommunications policy is made and changed, what agencies are active in policy making, how industry segments are affected by current policies, what key issues are now under consideration, and how you can influence future decisions. *Level:* Introductory.

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Technical Keynote: **Lincoln Faurer,** President and CEO, Corporation for Open Systems

Featured Speakers:

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Hotseat: **Harry Newton,** Publisher, *Teleconnect* Magazine

Strategy: **Dr. Dixon Doll,** Chairman, The DMW Group

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NEW PRODUCTS/COMMUNICATIONS

Racal-Vadic, Inc. has announced the **2400VP** full-duplex modem.

The modem is said to provide Microcom, Inc. Microcom Networking Protocol error control, ATPlus compatibility, speed conversion, an automatic voice-to-data switching circuit, front panel control and nonvolatile memory. It operates at 2,400, 1,200 or 300 bit/sec. synchronously or asynchronously.

The 2400 VP modem costs $595.

Racal-Vadic, 1521 McCarthy Blvd., Milpitas, Calif. 95035.

■

Astrocom Corp. has added the **SX-7** to its family of statistical multiplexers.

The SX-7 is said to be a seven-channel switching statistical multiplexer with a port selection feature said to allow the user to access both local and remote ports. It is compatible with Hewlett-Packard Co. INQ/ACK computers as well as ASCII and asynchronous protocols. It comes with an RS-232 interface and supports full-duplex synchronous modem operation at speeds up to 9.6K bit/sec.

The SX-7 is priced at $1,395.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

■

Ideassociates, Inc. has introduced **Ideacomm 1200S**, an asynchronous modem designed to fit in any short slot in the IBM Personal Computer, PC XT and PC AT.

The modem is said to feature Hayes Microcomputer Products, Inc. compatibility. It operates at 300 or 1,200 bit/sec. and provides terminal emulation. It supports Xmodem and Kermit protocols as error checking standards.

Other features include automatic dialing functions, storage of up to 128 telephone numbers and an onboard speaker with adjustable volume control.

The Ideacomm 1200S costs $395 including Ideacomm 1200 communications software.

Ideassociates, 29 Dunham Road, Billerica, Mass. 01821.

■

Anchor Automation, Inc. has announced the **Lightning F/I** full-card internal modem for IBM Personal Computers and compatibles.

The modem features Microcom, Inc.'s Microcom Networking Protocol (MNP) error correcting system. It comes with Lync Telecommunications software. The Lightning F/I operates at 2,400, 1,200 or 300 bit/sec. It features autoanswer, autodial, redial and hangup as well as an unlimited telephone directory.

The Lightning F/I costs $599. Without MNP, it costs $499.

Anchor Automation, 6913 Valjean Ave., Van Nuys, Calif. 91406.

■

Inmac has announced its **Clear Signal LDM Plus** line driver, designed to send data as fast as 9.6K bit/sec. for a distance of four miles.

The line driver is said to contain built-in optical isolators that protect data and equipment from voltage line spikes.

The Clear Signal LDM Plus as a self-contained stand-alone version costs $199. The card version costs $165.

Inmac, 2465 Augustine Drive, Santa Clara, Calif. 95054.

■

Bizcomp Corp. and **Northern Telecom, Inc.** have announced the **Bizcomp 4120-NT** autodial modem for use with Northern Telecom's Meridian private branch exchange (PBX) systems.

A modem pool of 20 units located at the Meridian PBX site can be shared by up to 800 users. Users can customize the modem to their own applications. It simulates the customary installation of one modem dedicated to one personal computer or terminal.

Features include control setup, call progress, automatic logon and call termination parameters.

The 4120-NT costs $549.

Bizcomp, 532 Mercury Drive, Sunnyvale, Calif. 94086.

■

Universal Data Systems, Inc. has added the **Sync-Up 201C/212A** and the **Sync-Up 9600B** to its Sync-Up modem series designed for micro-to-mainframe terminal emulation applications.

The Sync-Up 201C/212A operates half-duplex synchronous at 2,400 bit/sec. and full-duplex asynchronous at up to 300 or 1,200 bit/sec. via the dial-up Public Switched Telephone Network (PSTN). The Sync-Up 9600B provides half-duplex operation over the PSTN or two-wire private lines at 9.6K bit/sec.

Both models include automatic tone or pulse dial and answer as well as built-in diagnostics. Three software packages are available for them: Sync-Up Dial, Sync-Up BSC and Sync-Up SNA 3270.

Sync-Up 201C/212A costs from $900 to $1,350. The Sync-Up 9600B costs from $1,600 to $2,050.

Universal Data Systems, 5000 Bradford Drive, Huntsville, Ala. 35805.

■

Codex Corp. has announced the **Codex 6003 INP**, a point-to-point statistical multiplexer.

The 6003 is said to support four or eight asynchronous terminal ports. Operating over a 19.2K bit/sec. link, it allows network access via an asynchronous nondedicated terminal or a

Continued on page 112

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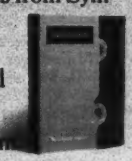

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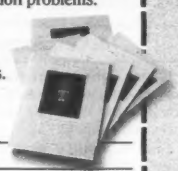

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Symbolics, Inc., Marketing Dept., 11 Cambridge Center, Cambridge, MA 02142

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Continued from page 106

front-panel, 32-char. LCD.

The multiplexer supports many asynchronous minicomputer protocols including those from Digital Equipment Corp. and Data General Corp., as well as the ENQ/ACK protocol requirements of Hewlett-Packard Co. equipment.

The Codex 6003 INP is priced at $1,250 and $1,900 for four- and eight-port models, respectively.

Codex, 20 Cabot Blvd., Mansfield, Mass. 02048.

■

Fibercom, Inc. has introduced **Whisperlink/SNA**, a local data modem said to allow users to connect an IBM 3274 controller to any Type A terminal or 3299 multiplexer tools.

Whisperlink uses optical fibers to allow full-duplex data transmission over data rates from 300 bit/sec. to 19.2K bit/sec. in either synchronous or asynchronous modes. The modem converts data signals at the standard 2.3587M bit/sec. into corresponding optical signals.

The Whisperlink/SNA data modem costs $350.

Fibercom, P.O. Box 11966, Roanoke, Va. 24022.

■

MDB Systems, Inc. has announced the **Turbo Mux,** a multiplexer for Digital Equipment Corp. Microvax II computers.

The Turbo Mux is said to utilize DHU11 emulation that is standard in MicroVMS operating systems. Data transmit rates can be a sustained 38.4K bit/sec. for all channels. The 32-port configuration costs $6,455.

MDB Systems, Box 5508, 1995 N. Batavia St., Orange, Calif. 92613.

■

Gould, Inc. has announced the **NW 0278 Modbus Port Multiplexer.**

According to the vendor, with the multiplexer, a single Modbus network can communicate simultaneously with multiple color graphic terminals, computers, process control systems, Manufacturing Automation Protocol gateways and other operator interfaces. Users can access multiple Modbus slave devices from multiple Modbus masters.

The single-board multiplexer is priced at $6,000.

Gould, P.O. Box 3083, Andover, Mass. 01810.

Test equipment

International Data Sciences, Inc. has announced the **Analog Test Capability** for its 5000 series network of test equipment.

The capability is contained in a voice frequency function module that provides control for the tests and a voice frequency interface module that provides direct access to four-wire leased lines. The modules are available on the Model 5100 data communications hand-held test set or the Model 5200 high-speed data communications test set.

The Analog Test Capability allows the Models 5200 and 5200 to transmit single-tone frequencies at 404Hz, 1,004Hz and 2,804Hz.

The Analog Test Capability costs $695.

International Data Sciences, 7 Wellington Road, Lincoln, R.I. 02865.

Auxiliary equipment

Phoenix Technology, Inc. has announced the **PCS/1** fault-tolerant, dual data-link, modular communications server.

The PCS/1 is said to serve as a local-area network attachment for four to 64 devices including terminals, personal computers, printers, host ports and modems. It is said to be fully compatible and interoperable with all Bridge Communications, Inc. networking products.

It has a redundant data-link capability said to allow the unit to detect a single media or data-link fault and automatically shift all traffic to the remaining operational media.

A typical 32-port PCS/1 configuration costs $17,950,

Phoenix Technology, P.O. Box 636 Cupertino, Calif. 95015.

Powermark has introduced the **Sinepro** standby power system, designed to keep small telephone systems on-line during power outages.

Sinepro features fast-transfer off-line operation, extended backup capability and sine wave output.

Sinepro standby power systems are available in power ratings of 500 VA and 1,000 VA and in 50-Hz and 60-Hz models. Prices start at $950.

Powermark, 3855 Ruffin Road, San Diego, Calif. 92123.

SYSTEMS & PERIPHERALS

Processors

The Lanier Business Systems Division of Harris Corp. has announced the **Concept 6300**, an office automation system said to allow users to attach up to eight personal computer workstations to Lanier's 6000 work group server.

The system supports the Lanier Concept 2000 Personal Computer, the IBM Personal Computer, PC AT and compatibles. Full Harrisnet 300 support is extended to PC workstations attached to the Concept 6300, according to the vendor.

Features include shared streaming tape drive option, support for up to 28 nodes, support for Microsoft Corp. Xenix 3.0 and MS-Net/MS-DOS and bus cable topology for connecting PCs.

A Concept 6300 upgrade kit for existing Concept 6000 systems is priced at $695.

Lanier Business Products, 1700 Chantilly Drive, N.E., Atlanta, Ga. 30324.

Presenting computers that fit them

IBM presents mid-range computers that offer a difference: Choice.

Here.

In the IBM System/3X family and the new IBM 9370 Information System you'll find an array of solutions that allow you to choose a total system to fit *your* business. Rather than tailoring your business to fit a computer system.

Where do these systems fit in?

Mainframe Territory

If you've already invested in IBM mainframe technology, the new 9370 Information System is a great way to enhance that investment.

The 9370s put IBM's powerful 370 mainframe architecture into a small, affordable package. Because they share a common architecture and offer a choice of four operating systems, 9370s allow you to choose from virtually all of the thousands of application programs available for IBM mainframes. Yet because they don't have to live in computer rooms, 9370s can run these programs from wherever you need them to be.

Here.

Because of the familiar architecture, personnel trained in IBM mainframe use will be at home with 9370s. With new prepackaged software, novices will soon feel at home as well. And 9370s will likewise be at home in many roles: as host systems, departmental systems or remote extensions of existing mainframes.

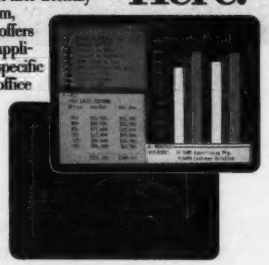
As your needs grow, 9370s can grow with them—with larger processors and more storage that's affordable and easy to install. Giving you a five-fold power range in the 9370 line—and a hundred-fold span of computing power within the 370 family from the entry-level 9370 to IBM's biggest mainframe.

Rugged Individualism

Where you need a standalone combination of power and simplicity—in departments, in dealerships, in distributorships or in small businesses—the IBM System/3X family fits right in.

System/36 is IBM's simplest and least expensive entry point into mid-range computing. In addition to being IBM's most user-friendly mid-range system, System/36 also offers a broad spectrum of application software from specific industry solutions to office applications that suit any business.

Here.



For growth, the System/38 provides a built-in relational data base (allowing you access to data on your own terms) as well as a toolbox of programming aids to help you, in a remarkably short time, custom-design applications that fit the job at hand.

The System/3X family members function equally well

Infotek Systems has introduced the **AM340** 4M-byte add-on memory for Hewlett-Packard Co. 9000 Series 200/300 technical workstations.

The memory employs 1M-byte dynamic random-access memories and single in-line package mounting technology. It provides an access time of 175 nsec and a cycle time of 400 nsec.

The AM340 costs $3,400.

Infotek Systems, 1400 N. Baxter St., Anaheim, Calif. 92806.

Graphics systems

Matrox Electronics Ltd. has announced the **MMG-640**, a graphics card for Intel Corp. Multibus II systems.

The 640- by 480-pixel color graphics controller card is said to operate at 60Hz noninterlaced and has eight bit planes. It can display 256 colors from a palette of 16 million. It drives two independent 640- by 480-pixel resolution color displays.

Features include on-board intelligence, two- and three-dimensional modeling commands, message passing and software drivers for Intel's Irmx.

The MMG-640 with Irmx driver is priced at $2,995.

Matrox Electronics, 1055 St. Regis Blvd., Dorval, Quebec, Canada H9P2T4.

Data storage

Emulex Corp. has announced the **UD33**, a microprocessor-based, firmware-controlled, SMD/SMD-E disk controller for Digital Equipment Corp.'s Unibus-based systems.

The UD33 provides Mass Storage Control Protocol implementation, rotational positional sensing and four-drive support. It also implements fast head select, features switch-enabled, adaptive direct memory access (DMA) and supports power-up autoboot or console boot.

The UD33 offers DMA transfers with 18-bit addressing, stacking of up to 13 commands, seek ordering and bad-block management.

The UD33 costs $3,500.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

■

DEI has introduced the **Series II** family of ¼-in. data cartridges.

Designed for use on standard tape drives or with tape drives featuring the QIC-120 recording format, the family includes the Series II Gold and Series II Silver cartridges for tape drives with 5¼-in. form factors and the Series II Gold Microtape 2000 cartridge for 3½-in. form-factor tape drives.

The Series II cartridge features a one-piece tape guide plus secured rotating components.

The Series II Gold and Series II Gold Microtape 2000 cartridges cost $49.50 and $31.50, respectively. The Series II Silver cartridge costs $43.50.

DEI, 10170 Sorrento Valley Road, San Diego, Calif. 92121.

■

Interscience Computer Services, Inc. has announced a family of **disk/tape subsystems**.

The standard configuration includes two disk drives totaling 1.2G bytes of formatted storage capacity and a 100 in./sec. group coded recording tape drive for backup. The disk drives are said to be storage module drive-compatible and feature an average positioning time of 18 msec and a data transfer rate of 2.46M bit/sec. The 1.2G-byte disk storage configuration with 100 in./sec. backup is priced at $45,000.

Interscience, 8950 Lurline Ave., Chatsworth, Calif. 91311.

■

U.S. Design Corp. has introduced **Virtual Optical Storage** (VOS) for Digital Equipment Corp. products

VOS is an optical disk drive storage system developed for the VMS operating system. It is compatible with DEC Q-bus and Unibus-based processors.

VOS is said to be a 2.4G-byte, 12-in. optical disk drive that emulates the standard DEC Files-11 file structure. It includes small computer systems interface host adapters, a mass storage magnetic system and a utility software package.

VOS is priced at $29,500.

U.S. Design, 5100 Philadelphia Way, Lanham, Md. 20706.

■

The Bubbl-Tec division of PC/M, Inc. has announced the **VFH-2** magnetic-bubble mass storage system for Motorola, Inc. VMEbus computers.

The VFH-2 is said to provide a fully formatted storage capacity of 1M byte on a single printed-circuit board.

The typical access time for the VFH-2 system is up to 10 msec. The effective data transfer rate is said to exceed 190K bit/sec.

The 1M-byte version of the VFH-2 system is priced at $2,989.

Bubbl-Tec, 6805 Sierra Court, Dublin, Calif. 94568.

■

Interdyne Co. has announced the **ID 3480-II** series tape drive, designed to utilize the IBM 3480 single-reel tape cartridge.

The drive is said to store 184M bytes of formatted data. It is plug-compatible with most standard QIC-36 or small computer systems interfaces. Additionally, the ID 3480-II tape drive has a transfer rate of 90K bit/sec.

Internal and external units are priced at $1,895 and $2,495, respectively.

Interdyne, 31 S. Milpitas Blvd., Milpitas, Calif. 95035.

the mid-range in where you need most:

as the largest computers in a business or as departmental computers in large companies. And to provide you with the communications and growth options your business needs, the System/3X family was recently enhanced to provide even smoother peer-to-peer communications, greater host and PC connectivity, and stronger networking with IBM 370 mainframes and PCs.

And if you need more power, you can expand the System/36 and System/38 independently, or you can link them in a network where they can share information and resources.

Here.

The System of Choice

One choice you won't have to make with IBM is where to find advanced technology, abundant connectivity options and numerous business solutions.

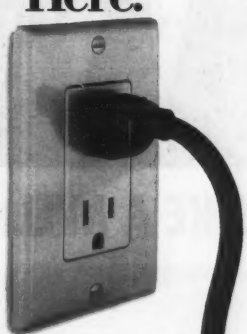
Because they're in all our mid-range computers, across the board.

Both the 9370 and System/3X families use IBM's one-million-bit memory chips and denser logic to achieve their high power and speed. And two new direct-access storage devices give the 9370 and System/3X increased capacity with unusual economy.

All this technology is fascinating in its own right. But it just gives you more in terms of real mid-range computing options: growth upward to mainframes, highways between mainframes and PCs or other workstations—or flexible connections with networks and enhancements either from IBM or other manufacturers.

And integrated office solutions to meet your needs are available on both systems.

Here.



Where You Work

Perhaps the best fit of all is the way IBM's mid-range computers fit into your working environment. The 9370s are very neighborly. With set-up times of under five hours and rack-mounted components that can be installed like stereo equipment. System/3X family members are simple to operate and fit in easily, too.

All are extremely quiet, need no special air conditioning and operate on standard 110 or 220 VAC wall current.

A Fitting Conclusion

The reason IBM mid-range systems fit in so well is based on a simple piece of logic: they're built to fit your business, rather than vice versa.

To find out more about which IBM mid-range system is the perfect fit for your company, call your IBM marketing representative soon. You'll learn about the kinds of choices you now have in a mid-range computer, and how you can start making them.

As it's only fitting you should.

IBM

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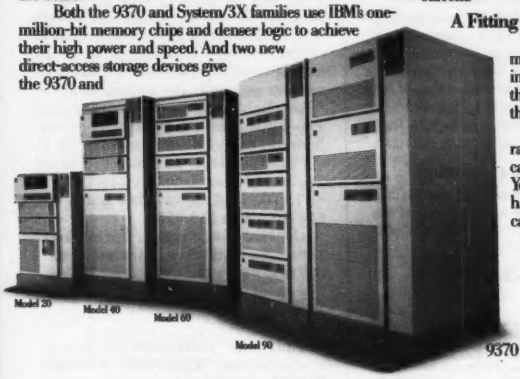

9370 Information System

The IBM Mid-Range. The System of Choice.

NEW PRODUCTS/SYSTEMS & PERIPHERALS

Maxell Corp. of America has announced the **Model OC-101 optical disk**, designed for personal computer and office automation applications.

The 5¼-in. write-once read-many-times disk is said to be capable of storing 13,000 letter-size pages on two sides. It is housed in a cartridge designed to fit the Hitachi Ltd. OD-101-1 optical disk drive.

Reportedly, the 600M-byte Maxell disk has the capacity to handle both code and image information. Each disk has 18,624 information tracks, with 16 sectors per track. Capacity per track is 16.4K bytes, or 1,024 bytes per sector. Recording density is 24K bit/in. and track density is 16K bit/in.

The Model OC-101 optical disk costs $200.

Maxell, 60 Oxford Drive, Moonachie, N.J. 07074.

Terminals

Telex Computer Products, Inc. has announced the **Airline Systems Automation** products, a series of airline terminals.

The terminals are said to be compatible with the Telex 1000/4000 airline terminals. They support passenger reservation records and flight operation data.

The products include the 078-A and the 080-A display terminals and an intelligent workstation with an airline host-connect feature. An 070-A control unit for attaching Telex displays and printers is also available.

The 078-A and 080-A are priced at $1,700 and $2,700, respectively, and include a choice of keyboard layout.

The controller and device feature board for Telex's Intelligent Workstation product cost $1,500 and $1,200, respectively.

The Telex 070-A controller costs $3,400.

Telex Computer Products, 6422 E. 41st St., Tulsa, Okla. 74135.

■

Applied Digital Data Systems, Inc. has announced the **ADDS 1010** entry-level display terminal.

According to the vendor, the terminal features a built-in parallel printer port, a 14-in. screen available in green, amber or white and an 83-key detachable keyboard.

The ADDS 1010 has six to 12 function keys and 15 to 30 reprogrammable editing keys with 120 characters of nonvolatile memory.

The ADDS 1010 display terminal is priced at $395.

Applied Digital Data Systems, 100 Marcus Blvd., Hauppauge, N.Y. 11788.

■

Liberty Electronics, U.S.A. has announced the **Freedom One Plus** and the **Freedom One Turbo** terminals.

The Freedom One Plus offers the ASCII feature set and Personal Computer Terminal operating mode. The terminal can function as an additional workstation on a personal computer when used in conjunction with slave cards.

It can also operate as an added user station on personal computers running Microsoft Corp.'s Xenix or Unix.

As an ASCII terminal, it emulates the Wyse Technology, Inc. WY-50, the Applied Digital Data Systems, Inc. ADDS Viewpoint A2 and the Televideo Systems, Inc. 925/950.

The Freedom One Turbo incorporates ASCII, ANSI and Personal Computer Terminal mode in one terminal.

The Freedom One Plus is priced at $549, and the Freedom One Turbo is priced at $599.

Liberty Electronics, 332 Harbor Way, South San Francisco, Calif. 94080.

Printers/Plotters

Applied Computer Sciences, Inc. has announced the **ACS/Dataproducts 2630** Wang Laboratories, Inc. VS/OIS-compatible laser printer.

The 26 page/min. printer comes with four internal fonts and can print up to three different font styles on one page. It comes with one 250-sheet paper tray, one 500-sheet paper tray and a manual-feed tray.

The ACS/Dataproducts 2630 Laser Printer costs $22,250.

Applied Computer Sciences, P.O. Box 2309, 12910 Totem Lake Blvd., Kirkland, Wash. 98083.

■

General Business Technology, Inc. has introduced the **GBT 5240BL** and **5241BL** bar code and label printers.

The printers are said to connect directly to the IBM System/34, 36 and 38 via standard twin-axial cable. The 5240BL and 5241BL print 300 and 600 line/min., respectively. They print any of 32 different bar codes and up to 10,000 repetitive labels with incrementing or decrementing numeric fields. Characters up to 10 in. high can be printed in standard or reverse image in any of four orientations. Bold, italics, underlining and expanded printing are available. Adjustable tractors accommodate up to six-part forms as well as paper from 3½ in. to 16 in. wide.

The 5240BL costs $8,695, and the 5241BL costs $10,995.

General Business Technology, 1891 McGraw Ave., Irvine, Calif. 92714.

■

Panasonic Industrial Co. has introduced the **KX-P1091I** and **KX-P1080I**, which are enhanced versions of its dot matrix printers.

The KX-P1091I prints 160 char./sec. in draft mode and 32 char./sec. in near-letter-quality applications.

It features IBM Proprinter em-

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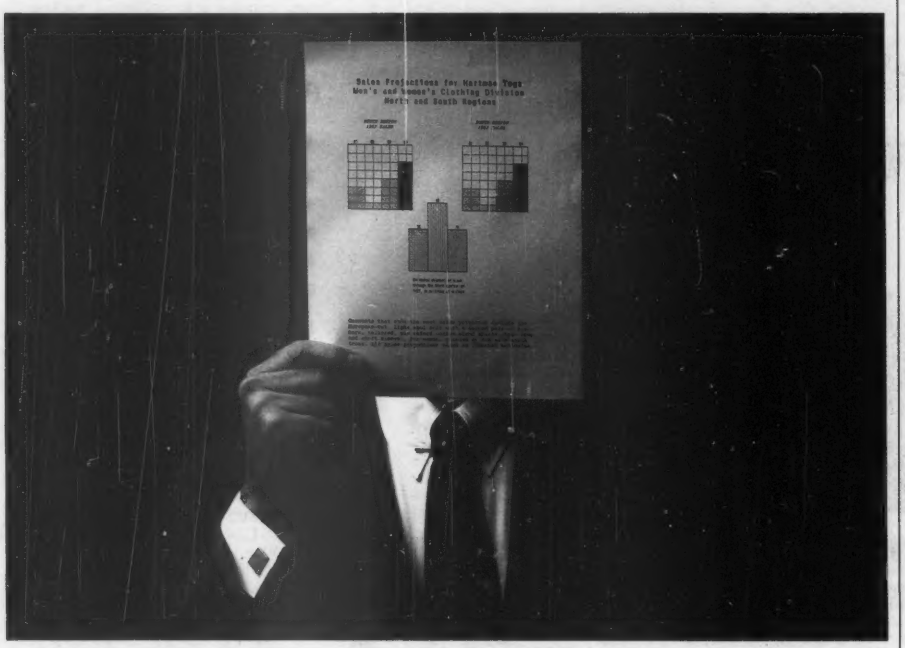

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Easily connected to any microcomputer, minicomputer or mainframe, the QMS KISS™ laser printer is excellent for creating reports, presentations and documents that help you stand apart from your competition. It generates 300-by-300 dots per inch of near-typeset quality text in any number of different typefaces, together with business graphics such as line drawings, pie charts and bar charts. Not only is KISS affordable and inexpensive to operate, it prints faster, quieter and with higher resolution than most daisy wheel or dot-matrix printers.

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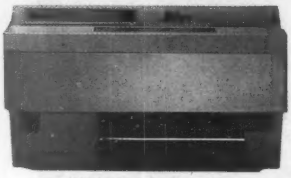
KISS features Epson® FX 80, Diablo® 630 and QUME Sprint® printer emulation modes and is compatible with the most popular business software like Lotus 1-2-3®, Microsoft Word®, WordPerfect and WordStar®. It comes standard with a parallel interface for easy connection. An optional dual serial/parallel interface is available if you need it. Also available is the QMS WedgeBox® interface for use with the IBM® System 34/36/38 and 3276 series.



QMS KISS makes laser-sharp printing an affordable reality

Impressive documents

Create stylish documents with a selection of 12 resident fonts. That's 8 more than the popular alternative which costs $1,000 more. (Based upon manufacturer's suggested retail price.) The ability to combine graphics with portrait and landscape text on the same page adds even more to the versatility of KISS.

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For increased functionality, consider QMS Big KISS.™ It has more typefaces, more memory and more graphics capabilities for producing complex business documents and forms. Its ability to use plug-in font cartridges adds to its versatility. Big KISS can do more, yet costs only $2,995. That's less than any other laser printer in its class.

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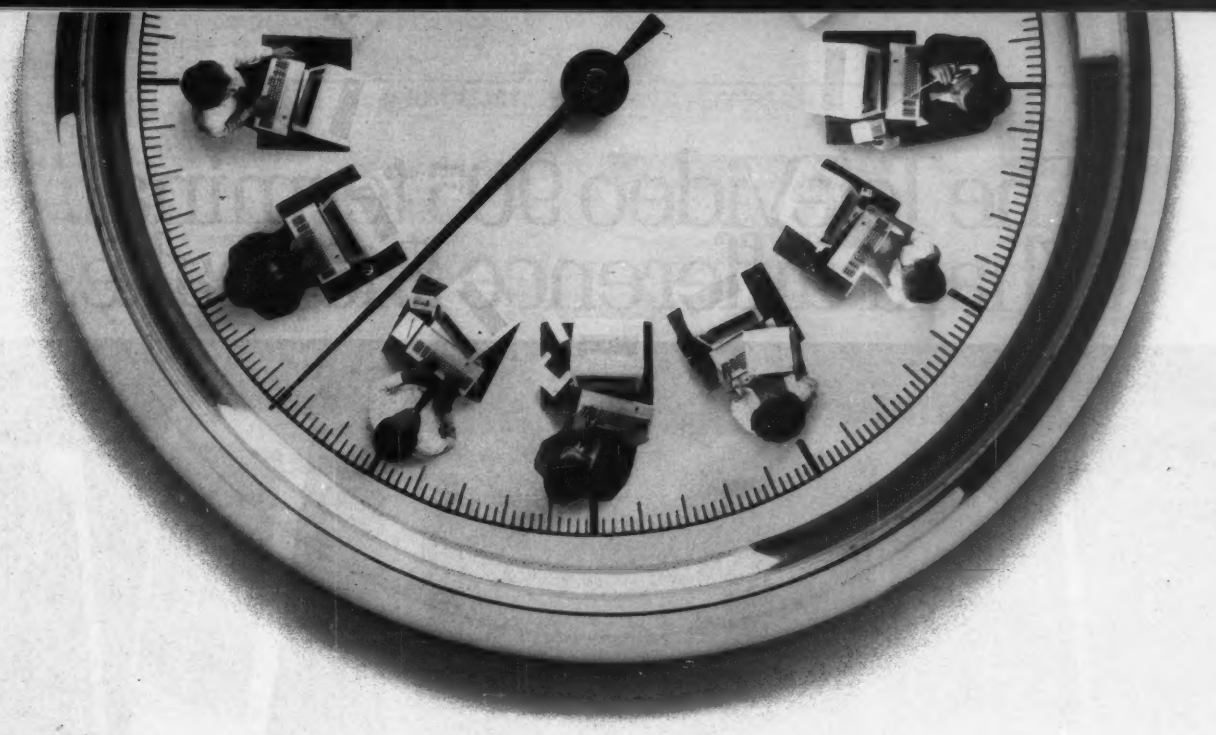

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*The 46% productivity figure was the average number reported by InterTest users in a survey that was conducted by Ernst & Whinney, one of the nation's leading public accounting firms. IBM is a registered trademark of International Business Machines.

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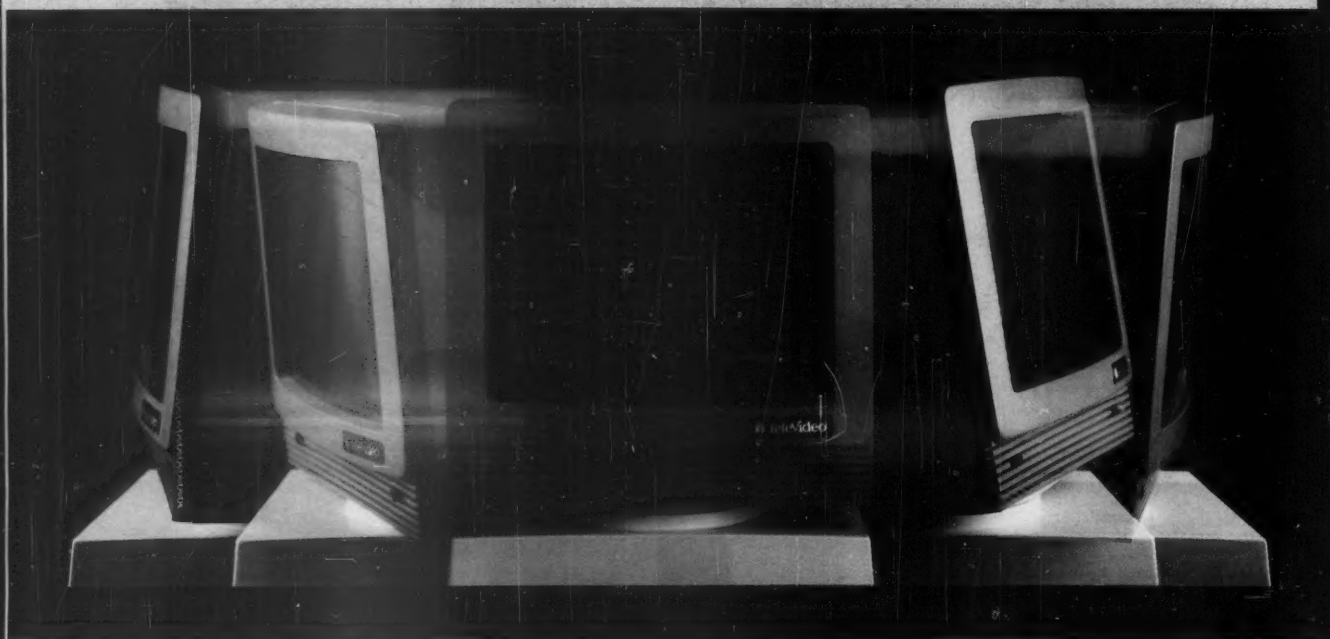
The TeleVideo 905 terminal. What a difference $10 makes.



Let's face it; there are a lot of $399 terminals being sold these days. You get a basic box, a few tacked-on bells and whistles, and not a whole lot more.

But now there's the TeleVideo® 905. At $409, it has a feature set so powerful, your customers will think they're sitting at an expensive workstation.

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A full-size keyboard with sculptured keycaps for smooth, comfortable typing. Sixteen non-volatile, programmable function keys. Keyswitches that have been tested to 100,000,000 strokes. Even an enhanced numeric keypad.

There's also a buffered printer port. And, of course, compatibility with the TeleVideo 925 command set, the most popular and widely emulated ASCII command set in the world.

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TELEVIDEO 905 VS. WYSE WY-30		
FEATURES	TELEVIDEO 905	WYSE WY-30
Individual programmable function keys	16	4
Tilt and swivel standard	Yes	No
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Continued from page 114

ulation and some word processing functions.

The KX-P1080I features IBM graphics and selected Proprinter code. It prints 24 char./sec. near-letter-quality mode in all pitches. In draft mode it offers a speed of 120 char./sec.

The KX-P1091I is priced at $429.

The KX-P1080I carries a price tag of $329.

Panasonic, One Panasonic Way, Secaucus, N.J. 07094.

■

Intermec Corp. has introduced the **Model 8404D** impact bar-code printer and the **1621 laser scanner.**

The printer is said to produce Code 39 and Health Industry Bar Code representing 14.7 char./in. of bar code. The laser scanner is said to be able to scan a bar code placed on uneven or curved surfaces. It features a scanning speed of 36 scans per second, and the laser can be held up to six inches from the bar code.

The 8404D printer is priced at $7,995. The 1621 scanner is priced at $1,395.

Intermec Corp., P.O. Box 360602, 4405 Russell Road, Lynnwood, Wash. 98046.

■

Facit Inc. has announced the **Opus 2E,** a laser printer.

The Opus 2E is said to provide printed text and graphics at 8 page/min. It also features interface options and graphics capability.

The standard memory capacity is 500K bytes, expandable to 2M bytes. The parallel and serial interface of the printer can be active at the same time.

There are six resident fonts, as well as optional font cartridges and downline load capability. Graphics capabilities include line, box and raster drawing. The printer offers a resolution of 300 by 300 dot/in.

The Opus 2E costs $3,895.

Facit, Nine Executive Drive, Merrimack, N.H. 03054.

■

Burroughs Corp. has announced the **B9246-24** impact band printer for its A, V and 900 series mainframe computer systems.

The printer is said to print at speeds up to 2,000 line/min. It is priced at $48,000 and seven-day, 24-hour maintenance is available for $520 per month.

The monthly lease price on a five-year agreement, including seven-day, 24-hour maintenance, is $2,715.

Burroughs, One Burroughs Place, Detroit, Mich. 48232.

■

Zetaco, Inc. has announced the **LPC-3,** a line printer controller for Data General Corp. minicomputers.

The LPC-3 supports either parallel- or serial-interfaced line printers. It features an RS-232 serial interface as well as a parallel interface.

It accommodates form printing for which vertical and horizontal tab controls are required. Horizontal format control capabilities have the capacity for up to 256 columns.

The LPC-3 costs $1,200.

Zetaco, 6850 Shady Oak Road, Eden Prairie, Minn. 55344.

Power supplies

Dranetz Technologies Inc. has announced the **Model 646-1** portable AC power line monitor.

The 646-1 is a single-channel instrument designed to pinpoint power disturbance problems in power lines serving digital equipment, according to the vendor.

It monitors power line sags and surges, under and overvoltages, impulses and frequency variations on both phase-to-neutral and neutral-to-ground.

The portable power line monitor provides a printed record of all disturbances, including time and magnitude.

The Model 646-1 is priced at $2,790.

Dranetz Technologies, P.O. Box 4019, Edison, N.J. 08818.

PRICE REDUCTIONS

Tecmar, Inc. has reduced the price of its **Captain** multifunction board.

The Captain board is said to be capable of expanding the memory of an IBM Personal Computer or compatible machine to the maximum of 640K bytes.

It also provides a parallel port and a serial port as well as a clock/calendar.

According to the vendor, each board comes with Tecmar's Treasure Chest of Software, which includes 24 programs such as a memo writer, a telephone directory and a print spooler.

The Captain multifunction board is priced at $179 with no memory and $399 for 384K bytes.

Tecmar, 6225 Cochran Road, Solon, Ohio 44139.

Bondwell has reduced the price of its **Bondwell-8** laptop computer.

The Bondwell-8 is an IBM compatible, 11-lb unit that features 512K bytes of random-access memory, a backlit 80 col. by 25 line display and built-in 3½-in. floppy disk drive, according to Bondwell.

Other attributes of the laptop computer include red-green-blue and composite color video outputs and an RS-232C serial port.

A parallel printer port, second disk drive port, modem, rechargeable battery and a real-time clock are also included.

According to the vendor, Microsoft Corp. MS-DOS and GW-Basic software are also included.

The Bondwell-8 is now priced at $1,295.

Bondwell, No. 10, 3300 Seldon Court, Fremont, Calif. 94539.

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COMPUTER INDUSTRY

Section begins on page 146

Perkin-Elmer's year-old data systems spin-off floundering

Firm banks on parallel processing for revival

By Alan Alper

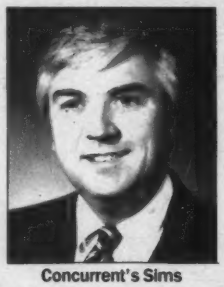
HOLMDEL, N.J. — One year ago, Perkin-Elmer Corp. decided to spin off its Data Systems group into a publicly owned company called Concurrent Computer Corp. At that time, both Concurrent and the computer industry were anxiously awaiting a rebound from the year-long industry slump. Both are still waiting.

Persisting softness in its core minicomputer business has plagued Concurrent in its first year of existence. Sales declined 6.8% to $244.8 million and profits tumbled 53.4% to $6.1 million. But Concurrent President and CEO James Sims still believes the decision to become an independent concern was the only way to go.

For starters, by going independent Concurrent was able to obtain the funding it needed to aggressively pursue the supermini market. The firm raised $37 million in its initial public offering in addition to the $131.5 million in equity that Perkin-Elmer kicked in.

The spinoff also enabled the Data Systems group to create its own identity, Sims maintains, and shed the image of being one part of a diversified electronics firm that was better known for instruments and government contract work than minicomputers.

"If you look at computer companies that are part of larger companies, their success is limited," Sims says. "The one fundamental reason is that there are differences in cultures and investment strategies as well as equity participation to keep and acquire critical people."



Concurrent's Sims

Although Perkin-Elmer still owns 82% of Concurrent, it plans to sell its holdings as business decisions dictate, Sims says.

Meanwhile, Concurrent is continuing on the path it has followed during the last few years, which stresses an application-driven, parallel processing-based approach to computing problems. Concurrent's architectural approach uses multiple processors to simultaneously perform different aspects of the same job.

"There is a large calling for systems that use parallel processing," notes Grego Kosinksi, an analyst with the market research firm Dataquest, Inc. in San Jose, Calif. "While much of the current technology applies to mainframes, supercomputers and superminicomputers, I believe in the next few years there will be applications at much lower price points." It is also a flexible approach to computing, for applications such as on-line transactional processing and process control and simulation, Sims says.

Sims claims that Concurrent's family of parallel processing-based systems, ranging from 6 to 36 million instructions per second, are less expensive to build, since they all use the same processor boards. "We have real economies of scale, since the product line is tied to the same processor. Compare that to Digital Equipment Corp., which builds seven or eight different processors for its minicomputer line," Sims notes.

"We're going after the market that DEC, Data General Corp. and other large mini companies are in," Sims says. "None of them have made the appropriate investment in the technology like we have."

In an era of mergers and acquisitions, the firm has also sought strategic alliances that further its objectives while keeping its costs in check. Last summer, the firm formed a joint venture with Nippon Steel Corp. in Tokyo to penetrate the Japanese supermini market. Concurrent, which owns 60% of the venture, feels the Japanese market is ripe for the picking, since most of its domestic vendors have focused on the mainframe and microcomputer businesses.

But why hook up with a $30 billion steel company? "They've got 4,000 programmers on staff and have the technology to do it," Sims says , noting that Concurrent assessed more than 20 potential partners before deciding on Nippon Steel.

The venture is shipping products after four months in existence, and Sims expects the deal to make significant contributions to Concurrent's bottom line. "Within two years, it could be 15% of our business," he declares. "That's quite doable."

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Failing French venture hinders country's optical disk effort

Financial woes threaten ATG

By Frederic Berge

PARIS — France's effort to secure a share of the slowly emerging optical disk market has come to a halt with the recent financial troubles of Alcatel Thomson Gigadisc (ATG), one of the largest French venture capital efforts ever launched.

ATG has been losing money ever since its start-up in late 1984, with current weekly losses running at about 1 million francs, or $150,000.

According to the company, ATG will pull in revenue of only $3.8 million to $4.6 million this year, far less than the $14 million to $15 million announced last spring.

Revenue last year also proved to be a disappointment for the firm. With $8.3 million in sales, the company was far below its projected $30 million.

Like most of its major competitors — Control Data Corp., N. V. Philips and Hitachi Ltd. — ATG overestimated users' ability to digest the immense storage capacity offered by optical media. Such major companies as Xerox Corp., which sold its optical disk unit Optimem to Cipher Data Products, Inc., have already pulled out of the sector.

One of ATG's weaknesses lay in the division of its capital. The venture's large number of backers did not individually have enough stakes to force long-term financial commitments.

Thomson CSF Communications of the ATG group owned 32% of the capital, followed by French computer manufacturer Groupe Bull SA with 5% and Rhone-Poulenc Systemes with 2%.

The remainder was divided between CIT-Alcatel and the financial groups Societe Generale de Belgique, Paribas, Suez and the Banque Nationale de Paris. The backers' initial investment was about 200 million francs, or $30 million, a considerable sum for France's nascent venture capital market.

The firm is reportedly investigating an alternative to closing down operations — finding new investors.

Berge is a Paris-based correspondent for Le Monde Informatique, *a French publication of CW Communications.*

National Semi cuts 500 jobs

By Clinton Wilder

SANTA CLARA, Calif. — Unable to return to profitability despite work force reductions of about 10,000, National Semiconductor Corp. recently announced the layoff of 500 additional employees worldwide.

The latest round of job cuts will take place in the next several months and affect all levels of employees, including management.

This marks National Semiconductor's first layoff this year, but the hard-hit chip vendor dismissed some 1,800 workers in two rounds of layoffs during 1985.

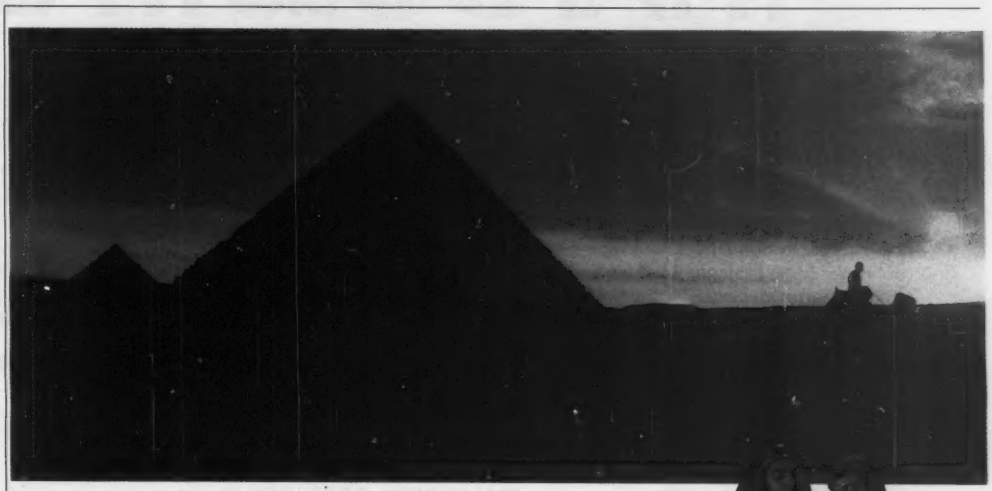
The other work force reductions have come through attrition, transfers and other methods.

Reduce work force to 30,000

The most recent action will reduce National Semiconductor's worldwide employment to approximately 30,000, down from a high of about 41,000 in January 1985.

Since then, the chip maker has reported six straight losing quarters, as the semiconductor industry slump has continued.

In its most recent quarter ended Sept. 21, the firm edged closer to the black, losing $1.4 million, or 4 cents per share, on revenue of $501 million.



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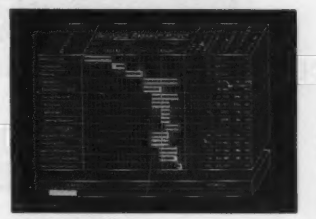

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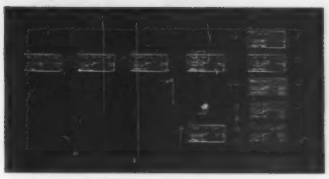

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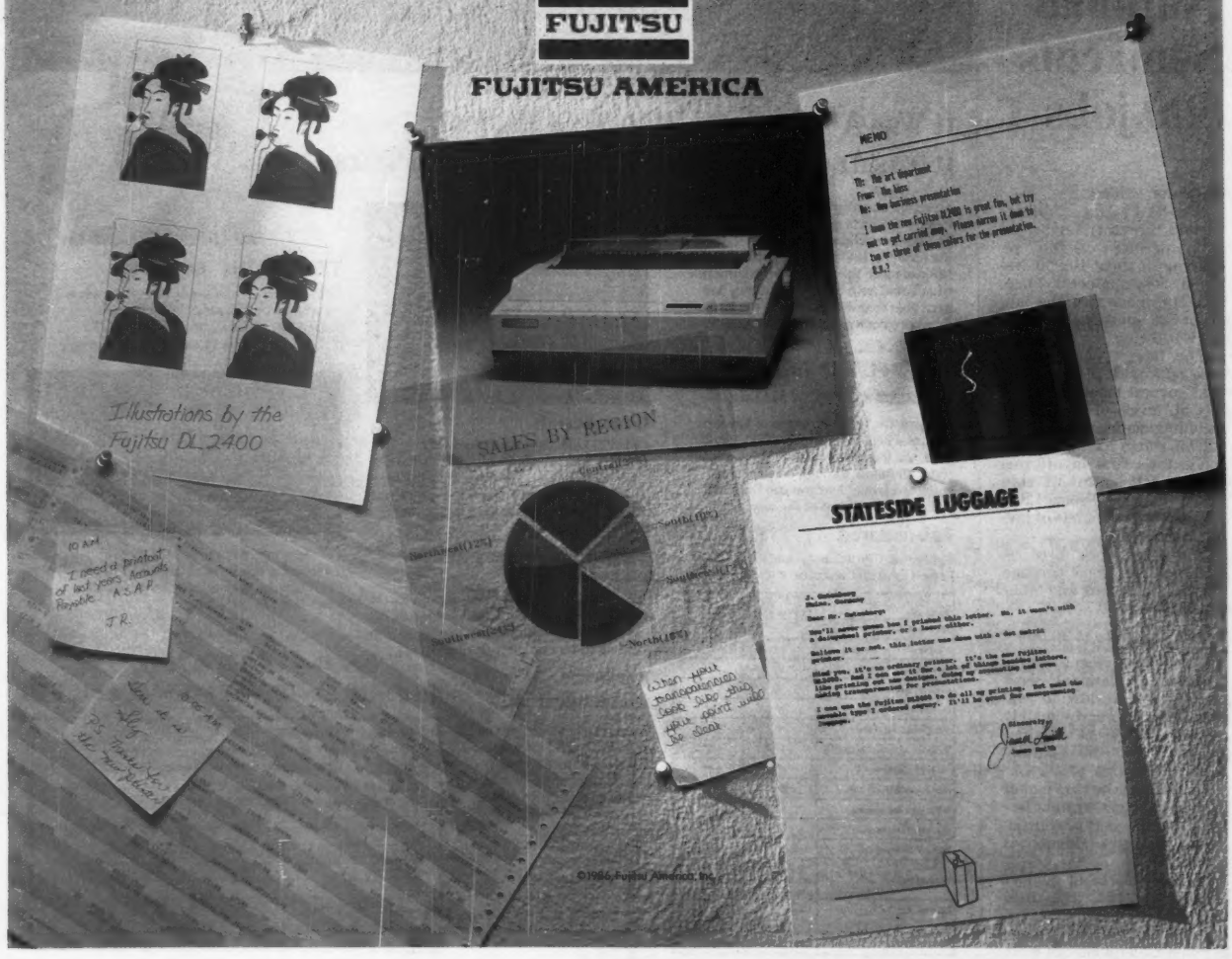

Siemens plans to market Fujitsu's 3090-class mainframe

OEM contract ties in with BASF venture

By Takehisa Kondoh

TOKYO — Fujitsu Ltd. has announced an OEM deal with West Germany's Siemens AG under which the Japanese manufacturer will supply its top-of-the-line M780 series mainframe to Siemens starting at the end of 1987.

Fujitsu says it expects orders for between 150 and 200 units in three years. The contract will broaden Fujitsu's current OEM relationship with Siemens, under which the M380 family of IBM 3081-compatible mainframes is being shipped to Siemens until 1989.

The M780 was unveiled as an IBM 3090 plug-compatible competitor last November, a year and a half after Japanese competitors Hitachi Ltd. and NEC Corp. released M680 and ASCOS 1500, respectively. Delivery to Japanese users is scheduled to begin by the end of this year.

> ***Sources said Fujitsu mainframes would be distributed by Siemens and the joint venture simultaneously.***

The M780 OEM pact was revealed one day after Siemens announced the creation of a joint mainframe venture with BASF AG, also of West Germany, which is reportedly geared to the European IBM-compatible market.

Sources said that Fujitsu mainframes, including the M780 systems, would be distributed by Siemens and by the joint venture simultaneously.

The M780 OEM deal would appear to end speculation in Japan that Siemens, with its plans to tie in with BASF, would shift to Hitachi as a Japanese OEM supplier for a post-M380 mainframe model.

Under an OEM arrangement, Hitachi has supplied mainframes and large-capacity magnetic disks to BASF since early 1980.

The speculation arose from Siemens' request last March that Fujitsu discontinue providing Siemens with the IBM-compatible MSP operating system, which the West German manufacturer had sold for use with its 7800 series mainframes. Siemens reportedly feared becoming involved in Fujitsu's dispute with IBM over the MVS/XA operating system.

Kondoh is Asian bureau chief of the CW Communications International News Service.

Hitachi, IBM form pact, end software feud

By Takehisa Kondoh

TOKYO — Hitachi Ltd. said last week that it had concluded a cross-licensing agreement with IBM on mainframe software that will reportedly allow reciprocal applications of software products developed by the two vendors.

Sources said Hitachi was also given rights to maintain full software compatibility with IBM mainframes on the condition that it does not violate the U.S. giant's copyrights.

The agreement will scrap a 3-year-old settlement that required Hitachi to pay for IBM's software as a result of a 1982 industrial espionage case.

Last week's pact would appear to ease the tension between the two firms due to copyrighted software.

'New rule established'

Both Hitachi and IBM Japan Ltd. would not divulge details of the new deal, which reportedly will be in effect for the next five years. Hitachi said, however, that "a new rule has been established on how to use each other's software property."

The cross-licensing pact was designed to review a compromise arrangement concluded between IBM and Hitachi in 1983, which settled a suit over the alleged theft of IBM's mainframe operating system, involving Hitachi and Mitsubishi Electric Corp. engineers.

Hitachi had reportedly been forced to rewrite its own operating system programs and pay IBM a monthly sum for using IBM's technical expertise. Originally effective for eight years, the previous agreement will be replaced by the new license-exchange contract.

According to an industry insider, this contract strengthens the belief that IBM will not quarrel with any future mainframe software from Hitachi.

The IBM-Hitachi coexistence contrasts sharply with Big Blue's current litigation with Fujitsu Ltd. involving alleged copyright infringement on the MVS/XA operating system.

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From page 146

unfriendly hands as a result of the Fairchild-Fujitsu alliance.

Meanwhile, key U.S. semiconductor vendors have held at least one strategy meeting to discuss the ramifications of such a merger. The Semiconductor Industry Association recently charged that Japanese manufacturers are up to their old predatory pricing tricks again, despite the trade accords reached last summer to control chip dumping.

All anxiety and accusation aside, should Silicon Valley be preparing a counterattack to repel this Japanese invasion? Does a joint venture between U.S. and Japanese companies, especially one where Japan has the controlling interest, spell doom for the U.S. semiconductor industry?

Not necessarily. It is regrettable that Fujitsu would gain the majority interest in Fairchild, but equal partnerships could be the saving grace for the industry in both countries.

It is no secret that important U.S. semiconductor firms, such as Intel Corp., have continued to report operating losses for some time now. However, Japanese chip manufacturers are not doing so well either. NEC Corp. just reported a 50% net profit decline, and Fujitsu said its profits dropped 82%, with both experiencing large semiconductor losses.

Both countries are going to have to develop long-term strategies, rather than scurrying to short-circuit immediate catastrophes, if they are going to prosper. In the long run, Japan-bashing here and chip-dumping there will help no one.

The bottom line is that Japan has the production capacity and manufacturing savvy, and the U.S. has the architectural innovation. If both countries could work together, at least to a certain degree, then those two halves might begin to equal a whole, and the semiconductor industry might begin to get back on its feet and off its knees.

As Japan and the U.S. continue to slug it out, distrusting one another and creating trade agreements aimed at short-term fixes to long-term problems, other countries in Asia and Europe are going to be increasing their presence in the semiconductor industry, and then what?

Clearly, government needs to lead the way. Instead of claiming to be immediately concerned with national security, it would be more appropriate in this instance for the White House to show some real interest in the U.S. chip industry's future. The U.S. cannot afford to lose this industry; it is much too vital for a competitive edge in technology.

There needs to be some coordinated effort to develop consistent U.S. policies regarding technology. Perhaps creating a Cabinet position for a technology industry representative would be a start.

The U.S. and Japanese semiconductor industries and their governments need to think this whole scenario through long and hard and, if possible, work together to develop partnerships that would benefit Tokyo and Silicon Valley. Or, if that doesn't sound appealing, there's always Pearl Harbor.

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Xerox applies AI to training

By Mitch Betts

WASHINGTON, D.C. — Xerox Corp. launched a nonprofit research institute last week to explore the use of expert systems as tutors for hard-to-train students and workers.

The Institute for Research on Learning is expected to research how people learn and to study the use of expert systems for diagnosing learning problems and coaching people in math, science and literacy skills.

David T. Kearns, chairman and chief executive officer of Stamford, Conn.-based Xerox, said the research is necessary because the U.S. education system is failing to supply businesses with workers who have basic skills of reading, writing and arithmetic. He said this hurts U.S. industrial competitiveness and costs U.S. businesses $25 billion a year in training expenses and lost productivity.

The institute will make its research public and is not intended to develop products for Xerox.

Restructuring costs Uccel first loss since 1982

DALLAS — Reflecting the cost of restructuring to focus on its core systems software and financial applications businesses, Uccel Corp. recently reported its first quarterly loss since 1982 for the third quarter ended Sept. 30.

The loss of $1.2 million, or 7 cents per share, was attributed to the $5.9 million write-down Uccel took in the quarter for the divestiture of its turnkey minicomputer systems business. The loss was partially offset by a one-time gain of $1.4 million from the sale of Uccel's micro software operation.

Uccel's net income from continuing operations, however, increased 49% over year-earlier levels to $3.3 million, or 20 cents per share. Revenue, however, rose just 3% to $31 million.

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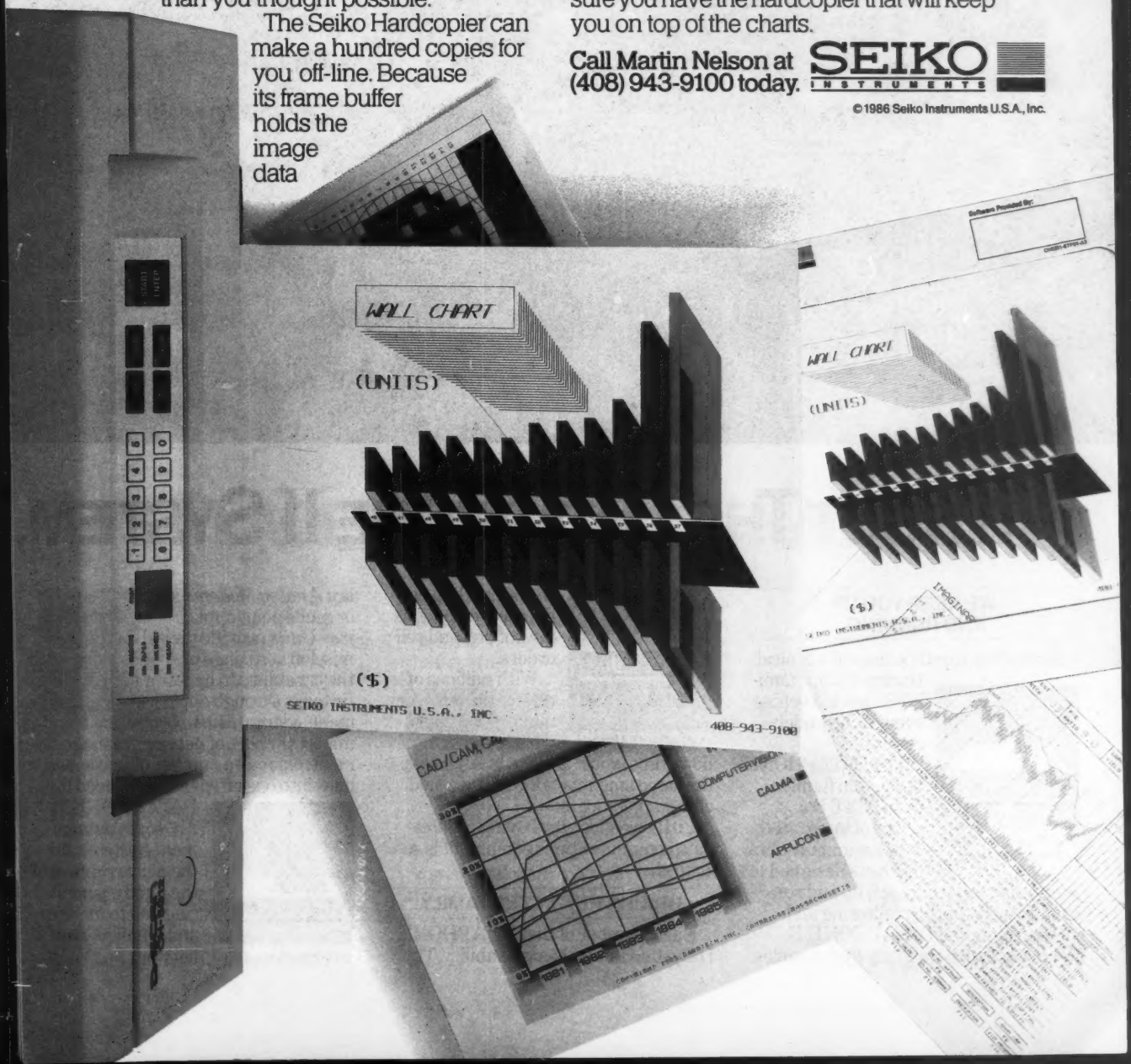

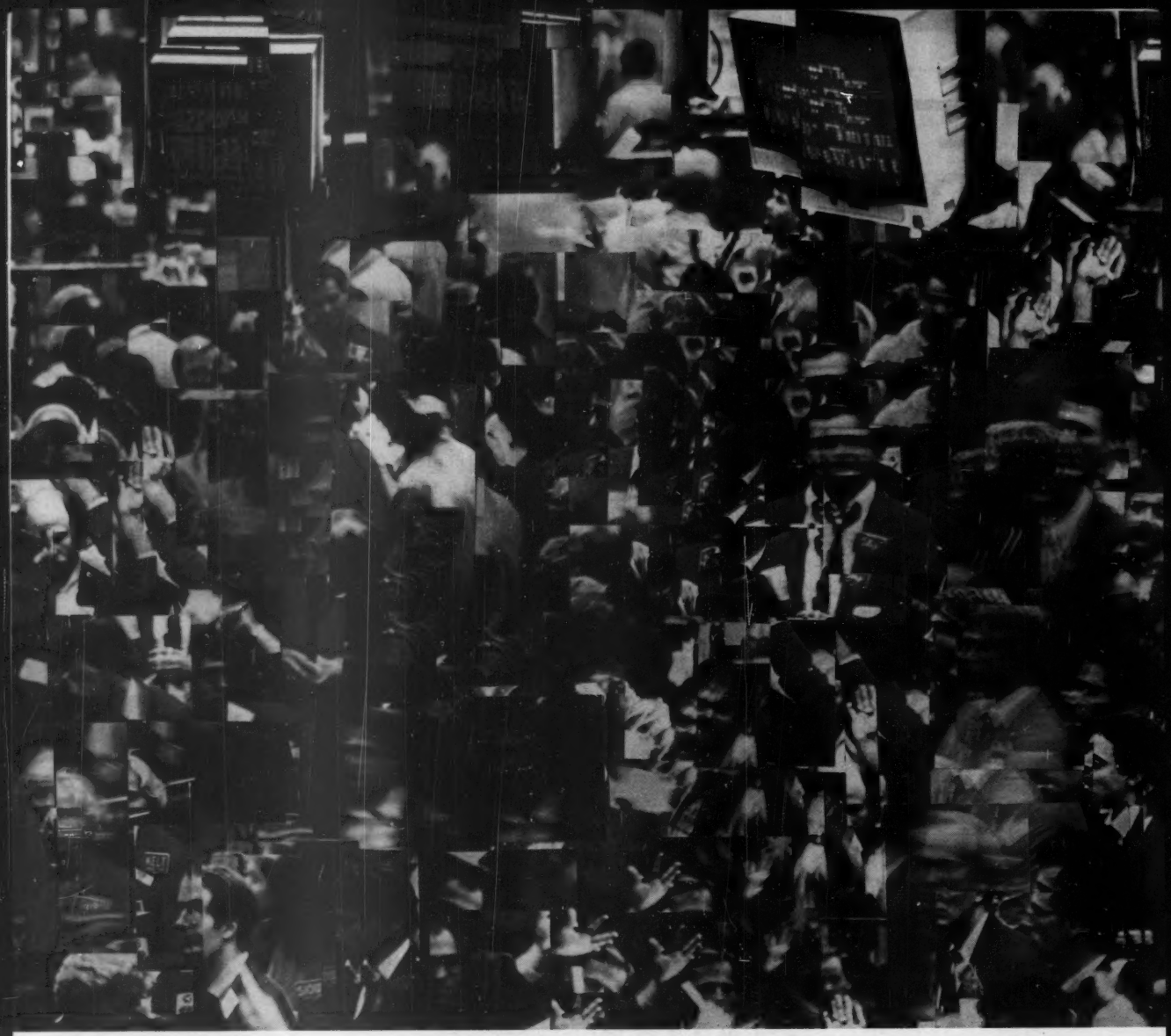

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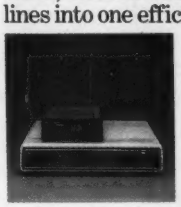

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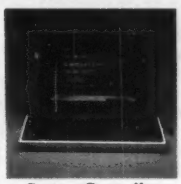

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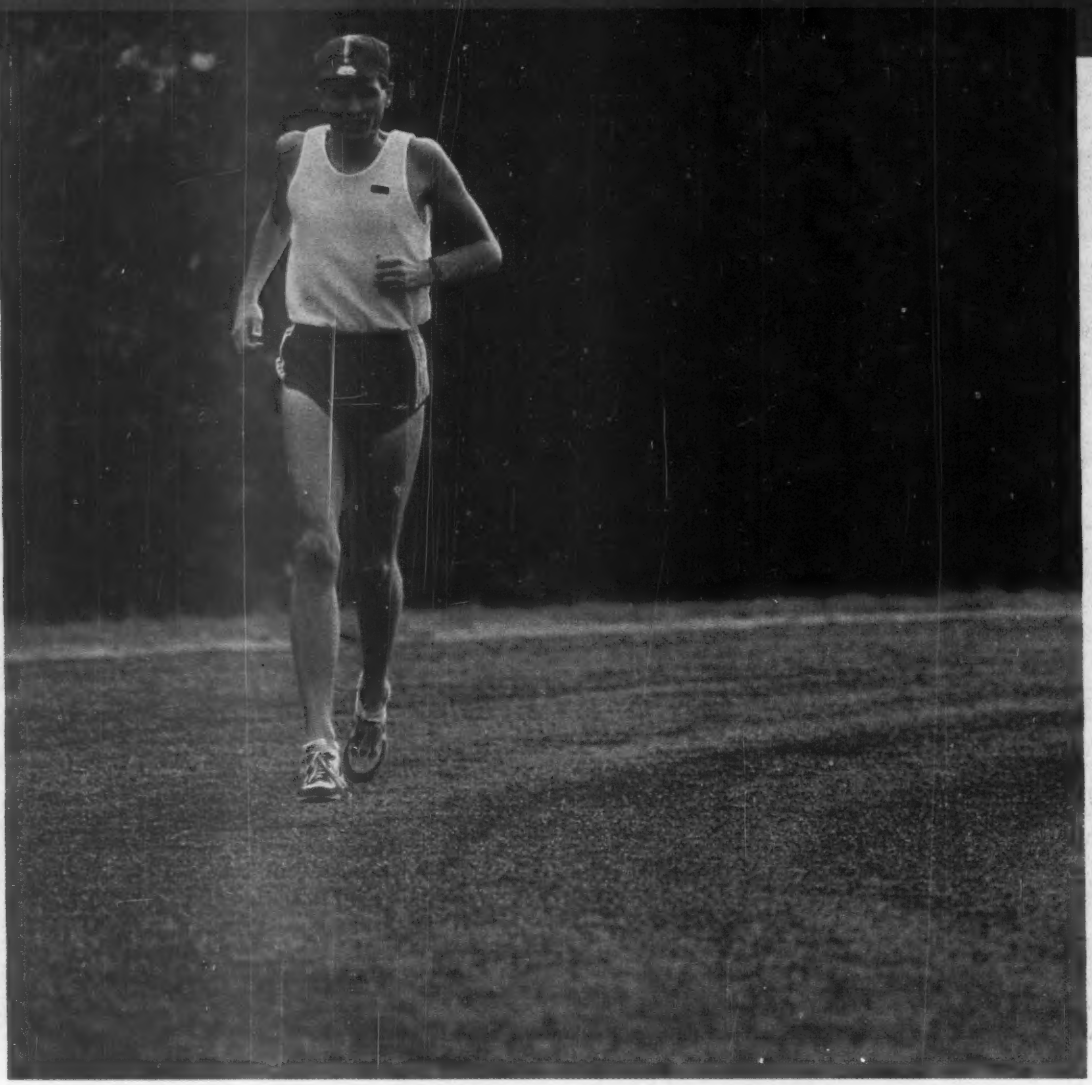

Dean F. Redfern
Age: 32
VP/Information Services
McCormack & Dodge
Annual Budget: $14.7 million
Road Racer

The influence of Information Services is beginning to extend well beyond the traditional boundaries of the computer room. Today's IS department is developing strategies for networking. Installing telecommunications. And busy adding micros in virtually every corporate department.

With a future so promising and dynamic, it's no wonder up-and-comers like Dean Redfern find Information Services so attractive.

Dean has always had the inside track in the world of computers. The son of a DP manager, he began programming in COBOL and Fortran at the age of 12. At 23, McCormack & Dodge, Dun & Bradstreet's software development company, hired him from his formal training at Hartford's Computer Processing Institute before he could even finish.

His philosophy was quite simple, even in his earliest days. Not one to live by others' rules, he vowed to employ any tactic, embrace any product, use any technology, as long as it got the job done.

Several years ago, for instance, he was forced to move his entire IS/DP department across town. IBM told him the job would require at least a week of downtime. And that was all the challenge Dean needed. He rented rooms for his staff for a weekend at a nearby hotel, and accomplished the task between business hours Friday to Monday. Every one of his 700 terminals was up and productive Monday morning.

In 1984, Dean designed and implemented a nationwide SNA network so all 12 U.S. offices could demonstrate McCormack & Dodge's mainframe software on site. That move contributed significantly to a 50% revenue growth in the following year.

Today, Dean is responsible for a staff of 150, and a budget of nearly $15 million a year—a good part of which goes to purchase the 300 micros (and attendant peripherals) he installs every year. And he reports directly to the CEO.

Dean is also an avid road racer—he runs some 60 miles a week—an active member of the BMW Car Club of America, and a world traveler.

As you can imagine, Dean's a busy man. But if you really want to reach him, you can.

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As young and accomplished as Dean is, he's by no means alone in his success. Information Services is a young industry. Full of individuals with individual visions. Yet they all seem to have one common insight.

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SUPERSHORTS

Western Digital Corp. has announced it has signed an agreement in principle with **Paradise Systems, Inc.** under which Western Digital will acquire all of Paradise Systems' stock in exchange for 2.6 million shares of Western Digital common shares.

Paradise Systems, located in South San Francisco, designs, manufactures and markets video controller chips and board products for IBM Personal Computers and compatibles.

■

Comp-U-Card International, Inc. and **Certified Collateral Corp.** have terminated a preliminary merger agreement under which Certified would have become a wholly owned subsidiary of Comp-U-Card.

Separately, Comp-U-Card has purchased **Marketing Outlooks, Inc.** for $10.3 million.

Marketing Outlooks is a privately held company based in Darien, Conn. The company sells checking account enhancement packages to banks and has more than 400,000 members at 430 banks across the country.

■

Analogic Corp. said that **Siemens Capital Corp.** has exercised its option to acquire from Analogic an additional 25% interest in **Medical Electronic Laboratories** (MEL).

MEL was formed to enhance the existing relationship between Analogic and Siemens for the purpose of cooperative development of advanced patient monitoring equipment for Siemens.

■

Interdyne Co. announced that a wholly owned subsidiary of the company has acquired the capital stock of **Peachtree Technology, Inc.** in Norcross, Ga.

Terms were not disclosed. Peachtree Technology is a privately owned marketing company of computer memory devices for the IBM Personal Computer, PC XT, AT and compatibles. Its product line is sold through a national network of dealers, distributors and retailers.

■

Westronix, Inc. announced that it has signed a definitive agreement to acquire **CU Tronics, Inc.**, a manufacturer of printed-circuit boards with 1985 sales of approximately $30 million.

■

Total Technical Services announced that it has sold its European computer service subsidiary, **SMS International B.V.**, to **Granada Group PLC.**

The sale will net Total Technical Services approximately $6 million. This financial gain will be used to expand its U.S. and China operations as well as to retire outstanding debts.

■

3M Corp. announced that it has purchased a minority share of the stock of **Optimem** in Sunnyvale, Calif. In conjunction with its investment, 3M will be represented on Optimem's board of directors.

Optimem was an early entry in the high-performance optical-storage disk drive field. The firm began working with 3M in 1983 to develop optical media for the Optimem product line.

■

California Micro Devices, based in Milpitas, Calif., has agreed to merge with **Custom Mos Arrays** (CMA), also in Milpitas, subject to CMA shareholders' approval.

■

Automatic Business Centers (ABC), a Moorestown, N.J.-based payroll services company, has become an independent, privately held company.

The move came as a result of a repurchase of the company from **Cigna Corp.** by **Moorestown Acquisitions, Inc.**, an investor group composed primarily of ABC management, including George Raymond, the company's founder and president. The purchase price was listed at $15.5 million.

■

Pansophic Systems, Inc. announced the acquisition of **Fusion Products International, Inc.** in San Rafael, Calif., in a stock transaction valued at approximately $7.2 million.

By acquiring Fusion, Pansophic enters the IBM System/38 and 36 markets with products substantially similar to its own mainframe offerings, including retrieval, report writing, data dictionary, query and PC Link packaged software programs.

■

Edgewater Resources Ltd. and **Migent Software, Inc.** have reached an agreement in principle under which Edgewater will purchase all of the issued shares of **Migent International Corp.** in consideration for 1.3 million shares of Edgewater.

Migent International is a private company affiliated with Migent Software. In September 1986, Migent Software announced the formation of Migent International to market Migent Software's products in international markets.

■

Sungard Data Systems, Inc. announced it has completed the acquisition of **Wismer Associates, Inc.** Sungard paid more than $10 million in cash and common stock to acquire all of Wismer's stock. Wismer is a provider of on-line computer services for portfolio management of state and municipal governments, corporations and thrift institutions.

■

Xerox Credit Corp. has acquired **The Dowdell Corp.** for an undisclosed cash payment. Dowdell is a Sacramento, Calif.-based equipment leasing company that also offers investment banking and financial advisory services.

Dowdell, founded in 1974, specializes in leasing equipment for the health care industry.

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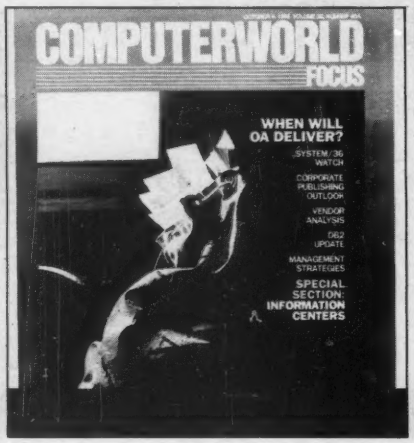

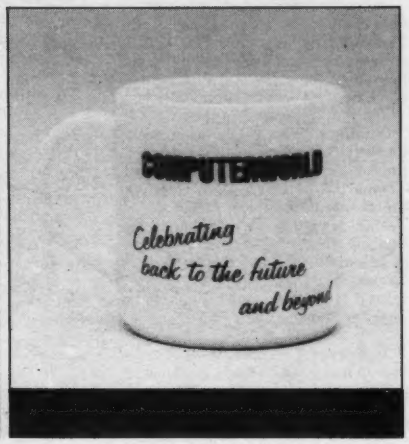

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Request for Proposal No. 1183, due Tuesday, December 2, 1986 at 3:30 p.m. for the upgrade of 3420 technology tape drives for the STATE COMPUTER CENTER.

Request for Proposal No. 1184, due Tuesday, December 9, 1986 at 3:30 p.m. for the acquisition of a 16 megabyte processor memory upgrade for a Digital Equipment Corporation VAX 11/785 in use at the MISSISSIPPI STATE UNIVERSITY College of Engineering.

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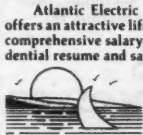

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ADVERTISERS INDEX

Adacom....12,13
Agile....72
Application Development Systems,Inc....15
Applied Management,Inc....37
Artificial Intelligence Corp....97
AT&T Information Systems....40-41,64,84,124-125

Bell Atlantic....57
BI Moyle Associates....27
Britton-Lee....58,59
Business Recovery Systems....80
Businessland....28-30

Cambex Corp....118
Cambridge Systems....33
Candle Corp....81
Chicago Soft....48
Chipcom Corp....90
Cincom Systems,Inc....50
Codex Corp....23
Communication Networks'87....106-107
Compaq....62-63
Computer Consoles Inc....70
Computer Corporation Of America....147
Computer Dimensions, Inc....59
Computer Management Research....85
Computer Task Group....31
Computer Technology Group....72
Concurrent Computer....79
Cullinet....9
CW Circulation....128
CW Denmark....58
CW Executive Report/Product Spotlight....142
CW Germany....121
CW ROP Promotion....126

Data Design....22
Data General Corp....82
The Data Group Corp....69
Data South....78
Datasphere....8
Develcon....33
Diconix, Inc....61
Digital Communications Associates....32

Empact Software....39
EPE....88-89

Fibronics....12
Formscan....8
Fujitsu....120

Hewlett-Packard....76
Honeywell Info Systems....102-103

IBM....54-55,112-113
Infodata....20-21
Innocorp....13
Innovation Data Processing....5
Issco....119

Javelin Software Corp....36

Keytronics....96

Lattice Inc....122
Lawson Associates....65
Local Data....10
Lotus Development Corp....49,73-75

McDonnell Douglas....48
Michaels, Ross & Cole....36
MicroPro....108
MSA....148
Multitech....53

NCR....98-99
North Ridge Software....127

On-Line Software International....60,115
Oracle Corp....11

Quadram....104
Quality Micro Systems....114

Radio Shack....101
Realia Inc....105
Relational Technology....18
RSD America....71

SAS Institute....24-25,35,91
Search Software....44
Seiko Instruments....123
Software Products....23
Software AG....42
Software Technology....101
Storage Technology....93
Symbolics....109-111
Syncsort....3,26
Systematic General....117

Telenet....45-47
Televideo....38,68,116
Texas Instruments....92
Travtech....118
Triangle Software....85
TSSI....100
Tymnet....34

Unicorn....80

Visual Technology....66
VM Software....7

Wang Laboratories....14
Whitesmiths, Ltd....100
Wyse Technology....86-87

Xerox....37,94-95

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Computer Assoc. on buying spree

From page 1

for Software International.

A week earlier, Computer Associates made a $70 million tender offer for Integrated Software Systems Corp., which reported $40 million in revenue in 1985.

The acquisitions would provide Computer Associates with a toehold in the growing Digital Equipment Corp. VAX marketplace and an international sales force of 800 that gives it the chance to leverage new products that complement its existing mainframe and micro lines. "I don't see any reason why we can't reach a $500 million company as quickly as possible and eventually a $1 billion company," said company Chairman Charles B. Wang.

Computer Associates' revenue for fiscal 1987, which ends March 31, 1987, is projected by Wall Street analysts to be $255 million and will swell above the $300 million mark if the two acquisitions come off as planned.

With business maintained at this year's levels, Computer Associates can anticipate revenue in the $330 million range before applying what Wang says is its traditional 30% to 35% growth rate. If that growth is maintained, the enlarged revenue base would yield a $500 million company sometime in 1988 (fiscal 1989) and a $1 billion company sometime in 1991 (fiscal 1992) without any further acquisitions.

Even if Computer Associates grows only as fast as the industry, it will reach the $1 billion milestone in seven years, estimated Gilbert Mintz of Fort Lee, N.J.-based Broadview Associates, a consulting and investment banking firm for software and services acquisitions.

Such a position could be a formidable one, said veteran software industry observer Tom Lawton, editor of the "Computer Services Report" in Belmont, Mass. "In the direction that they are heading, market share becomes very important," Lawton said. "They could do an awful lot with pricing and make it tough for the competition."

Wang said he expected the firm's acquisitions to continue at a pace of two or three a year. Such a path will cause it to far outstrip its nearest mainframe competitors, Management Science America, Inc. (MSA) of Atlanta and Cullinet Software, Inc. of Westwood, Mass., in the $180 million to $190 million class.

MSA's revenue should climb to more than $220 million with the proposed acquisition of Comserv Corp. [CW, Nov. 10]. Both Lotus Development Corp. and Microsoft Corp. in the microcomputer arena have exceeded their mainframe cousins in size, but for the immediate future, Computer Associates' spurt appears to have left them behind as well. "We feel we have barely scratched the surface," Wang said. "We have sold an average 2.6 products per client, so there is still a lot of potential there."

In addition to size, the two acquisitions give the company "a nice, graceful way to get into the Digital Equipment Corp. market," said Anthony Wang, president and chief operating officer at Computer Associates and brother of the chairman.

Issco and Software International together represent $16 million in revenue derived from sales to DEC customers, Charles Wang said.

With Software International, Computer Associates also acquires a mainframe accounting product line, the Masterpiece series, that will compete with its own Advanced Business Series accounting packages. Both products will be continued for now and eventually will be merged, Anthony Wang said.

The move into applications signals a significant change in the company's growth plans, Lawton added. "I wouldn't think they are going to do just one applications acquisition," he said. "But it takes a very different style to succeed in applications — more support, more hand-holding and a less sophisticated client base. That market is awfully competitive, and the margins have not been as good as in systems software."

Although Software International's Masterpiece series is regarded as an equal to other integrated accounting products, it was issued up to two years behind competing products from McCormack & Dodge Corp. and MSA.

Jeffery S. Goodman, president of Software International since 1983, said he anticipated Software International will become an applications center for the Jericho, N.Y.-based Computer Associates. In addition to the Masterpiece accounting series, it offers human resource systems and a micro-to-mainframe link, Smartlink. The Andover, Mass.-based Software International employs 380 people and has 5,000 to 6,000 packages installed worldwide, company officials said.

Goodman said GE was willing to sell Software International because it was "not a key part of its information strategy. We will have a much greater growth potential with Computer Associates."

Computer Associates maintains a strong presence overseas, with a total of 800 sales and support staff worldwide. Forty percent of its revenue is derived from international sales, Charles Wang said.

Micro vendors test federal mart

From page 146

Md., office.

• NEC Information Systems, Inc. opened a Vienna, Va., office for federal marketing.

• Houston-based Compaq Computer Corp. added three models to its line of micros that meet the government's so-called Tempest security requirements for suppression of electromagnetic emissions that could disclose classified data.

• Lotus Development Corp.'s Arlington, Va., office announced it will sell an unprotected government edition of the 1-2-3 spreadsheet package to satisfy government objections to copy protection and will beef up its customer support services for federal agencies [CW, Nov. 10].

• Apple Computer, Inc. added a new Reston, Va.-based unit, aiming at the government market for the first time. The unit employs 50 people.

• Micro Support Resource Corp., the nation's largest personal-computer-support services company, opened a training center in Washington, D.C., for federal workers.

Epson officials, in a recent interview, said they have been preparing to increase their federal market presence for the past two years.

"Epson already is the largest supplier of dot matrix printers to the U.S. government. Now that we have an IBM-compatible personal computer product and service centers across the country, we're more acceptable to the federal government," said Eugene R. Knude, vice-president and chief of staff at Epson headquarters in Torrance, Calif.

Knude said Epson sees the government as a large and growing market opportunity, particularly since federal procurement rules require competitive bidding, which means IBM does not have a lock on the market.

Geoffrey G. Stilley, director of federal sales and head of the new Rockville, Md., office, said Epson has three ways to sell to agencies: through its dealers for sales of fewer than 1,000 units; through the Rockville office for salesof more than 1,000 units; and through systems integrators for complex applications.

Epson hopes to make federal sales about 10% of its direct-sales business next year, said Martin L. Strayer, vice-president and general manager of the computer products division.

Apple also sees an opportunity in a market in which IBM is not a universal standard. "Large-scale federal bids are specified by function, not product," said Frank Sauer, Apple's recently named manager of government sales and marketing. "Government specs don't require [Microsoft Corp.'s] MS-DOS or a particular microprocessor chip."

Like Epson, Apple will use several distribution channels to sell to the government: direct sales, dealers, value-added resellers and systems integrators. Sauer noted that many systems integrators are bidding with Unix-based systems, and Apple recently announced Unix support on the Macintosh.

CW senior editor Clinton Wilder contributed to this story.

Posner argues for small teams

From page 146

strength of a large firm. As a result, Esber reasoned, Ashton-Tate should maintain its dominance in the data base market.

Posner agreed that Ashton-Tate will hold its market share, at least in the current marketplace. "You're not going to end up taking that much market share in current applications," he said, adding that users are reluctant to change data bases after developing specific applications for them. Software analysts say the battle will be for applications written for the next version of MS-DOS.

Ansa's next move should be the early 1987 announcement of a local-area network (LAN) version of its software with full record and file locking. The product will run on all popular microcomputer LANs.

Posner said his long-range goals for Ansa are to expand international distribution and create a multiproduct company.

Court overturns injunction filed by DEC against Emulex

By Alan Alper

WASHINGTON, D.C. — The U.S. Court of Appeals for the Federal Circuit last week overturned a portion of ruling handed down by a lower court last spring that had enjoined Emulex Corp. from marketing disk and tape controllers that Digital Equipment Corp. alleges use misappropriated technology.

While Emulex is no longer enjoined from developing and marketing the DEC-compatible products, which allegedly use DEC technology, a DEC spokesman pointed out that three of the four provisions in the preliminary injunction remain in effect. "All the Court of Appeals is saying is that the [U.S.] District Court should have followed procedures when issuing the preliminary injunction," he said.

DEC intends to "promptly" ask the District Court to follow the procedures set out in the Court of Appeals ruling, the spokesman said, "to reimpose the maximum relief that Digital is entitled to."

Last week's ruling stems from a 16-month-old suit in which DEC alleged that Emulex infringed on its patents related to certain disk and tape controllers. The suit was later amended to include misappropriation of trade secrets, after DEC claimed that a former employee, Charles Hess, had allegedly taken trade secrets when he joined Emulex in early 1985 with the Costa Mesa, Calif., firm's knowledge. Hess was fired from Emulex in January 1986.

The District Court issued a preliminary injunction in April which, among other things, enjoined Emulex from designing, developing, manufacturing and marketing any product designed to connect with any DEC product that uses protocols specified in its direct access storage technology.

The appeals court had stayed that portion of the District Court ruling in August pending further examination of the issues.

The three provisions of the preliminary injunction that remain in effect continue to prevent Emulex from disclosing DEC's alleged trade secrets, from employing or using Charles Hess in any capacity and from failing or refusing to return to DEC all documentation, computer tape or other material obtained from nonpublic sources.

The patent infringement portion of the case remains unresolved, both companies said. A date has not yet been set to hear the matter.

Chip agreement blasted

CBEMA says defects will hurt U.S. market

By Mitch Betts

WASHINGTON, D.C. — The U.S.-Japan semiconductor trade agreement has a variety of defects that will hurt the competitiveness of U.S. computer vendors, the Computer and Business Equipment Manufacturers Association (CBEMA) has charged.

In a recent letter to U.S. government officials and in an interview with *Computerworld* last week, CBEMA officials spelled out several concerns about the July antidumping accord, which sets a price floor for Japanese chips imported to the U.S. The price floor is a fair-market value based on the individual firm's actual costs plus 8% profit.

CBEMA and other U.S. trade associations also have complained that the Japanese are selling chips below cost inside Japan — making it tough for U.S. firms to crack Japan's domestic market — and in third-country markets, such as Hong Kong, Taiwan and South Korea.

Last week, U.S. trade officials threatened to cancel last summer's trade agreement if the third-country dumping by Japanese vendors continues.

"The net effect of this agreement could be to make U.S. companies look very hard at transferring production to some of these third countries," said CBEMA Executive Vice-President Oliver Smoot. "If the agreement works in the U.S. and Japan and you're facing competition from equipment manufactured in Korea or Singapore because they can get access to lower cost chips, then you've got a problem and may consider moving production there," Smoot said.

Compaq Computer Corp. recently became the first U.S. systems vendor to cite the agreement specifically as a spur to offshore manufacturing. Michael Swavely, Compaq's vice-president of marketing, said that while Compaq was already planning to open a plant in Singapore, the chip agreement confirmed and accelerated the decision. The facility, Compaq's first outside the U.S., will assemble printed-circuit boards and employ about 200 people.

Another defect of the trade pact, according to Smoot, is that the accord does not necessarily prevent Japanese firms from using below-cost chips in computer products sold to the U.S., thus undercutting U.S.-based computer vendors.

When the Japanese semiconductor firm is affiliated with the computer firm, the chip price is an internal transfer price and not affected by the U.S.-Japan agreement, Smoot explained. "If you have a box coming into the U.S. and 50% of its value is in chips covered by the agreement, the U.S. can't question it," he said.

Another defect, Smoot said, is that the U.S. Department of Commerce is using a methodology for setting the crucial fair-market value that is artificially high in the early years.

He said the department is using the learning curve method, which means that the costs of developing new products are added to the price in the first few years of sale, after which the price drops dramatically. CBEMA urged the agency to use an alternative method, called product cycle pricing, which spreads the development costs over the expected life of the products.

Because the learning curve method creates high prices in the first few years a new product is sold, Smoot said, "It has a big impact on the rate at which new chip designs will be utilized. There is a great deal of concern it will slow down the introduction of new semiconductor products."

Technology investors ponder alternatives of new tax code

ACTIVE ISSUES
Kathy Porteus

Will tax reform influence the way investors look at technology stocks?

Under the new tax code, the tax rate on long-term capital gains will increase from 20% to 28%, while personal income taxes will drop from a maximum of 50% to 28%. On the surface, this appears to favor income-oriented investments, such as dividend-paying stocks or interest-paying bonds, at the expense of growth-oriented investments such as technology stocks. Rather than pay dividends, high-growth companies prefer to reinvest earnings by funding their own growth.

According to Mike Wolf, vice-president of the IDS Advisory Group in Minneapolis, there are enough questions about the current situation in technology that "in general, tax reform may be one more reason why people will want to stay light in this area."

However, Doug Loudon, managing director of Scudder, Stevens & Clark, says "whether or not individuals will become more interested in income-oriented vs. capital growth investments is not clear-cut." According to Loudon, technology investments have always been perceived as higher risk, higher volatility kinds of investments with higher potential return.

"I don't think the new tax law really changes this," Loudon says, "because people interested in those kinds of investments will still be interested and because capital gains compound on a pretax, rather than a realized, basis."

While income from dividends or interest is taxed immediately, tax on capital gains is deferred until the investment is sold and profit realized. "If you invest in a rapid-growth company," Loudon says, "you get to compound your money on a pregain basis, whereas if you are taking the gain out in income every year, paying taxes and reinvesting what's left, the impact of your compound total return is significantly diluted."

Steve Yoken, vice-president of research for L. F. Rothschild, Unterberg Towbin, compares a company with a potential total annual return of 13%, or 8% growth and 5% yield, with a technology company that is growing at a 25% annual rate. "Even with a 28% capital gains tax, I don't see why anyone would want to choose the dividend," Yoken says.

Both Loudon and Yoken say some technology companies, because of tax reform, may choose to offer convertible securities when raising capital in order to provide an income yield and make their offering more competitive with other income-oriented investments. But, Yoken says, a disadvantage of convertible securities is that they create potential dilution in per-share earnings.

Another issue confronting investors is whether to sell appreciated stock positions in 1986 to lock in the lower tax rate on capital gains. Some investors, who believe a stock has potential for significant further growth, are selling their stock and then immediately re-establishing their position.

"Before selling stock to lock in the tax benefit," Wolf of the IDS Advisory Group advises, "investors should know how long they plan to invest in the stock."

According to Scudder's Loudon, investors must also go through the arithmetic of assessing the impact of tax reform on the company, analyzing the company's financials and estimating potential growth.

Despite the enormous publicity surrounding the investment implications of the new tax laws, analysts and money managers say the tax issue should never be the primary reason for either buying or selling an investment. Rothschild's Yoken says he even believes that a year from now, the current tax bill will not look anything like it does now, because of congressional "tinkering."

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Burroughs + Sperry = Unisys

From page 146

will be called the Unisys A Series and the Unisys 1100."

Also important, he said, was the new corporate color: red. "We didn't want to be blue," he said, referring to IBM's trademark and nickname.

Salesmen will call on customers from Unisys Corp., not from Burroughs or Sperry, but users may see signs bearing the former names for months, and perhaps years, to come.

Atlanta-based Burroughs software manager Lee Machen won $5,000 for submitting the winning name, one of the 31,000 entries that resulted from a worldwide name-finding contest among Burroughs and Sperry employees last summer. Among the names rejected were Busynex, Sparrow, Buros, Busper, SQUABB (Sure Quality Alternative to Big Blue), Burrovac and Data-be-the-Day.

A New York corporate identity consulting firm approved the winning name and gave the company new colors of red, silver and black. Then, in September, a worldwide advertising campaign was drawn up by the New York firm of Young & Rubicam.

But while the Sperry and Burroughs organizations are merging at a faster-than-anticipated pace, there are still some loose ends. There will be nearly 10,000 previously announced cuts in the Unisys work force before Jan. 1, as the new entity streamlines its staff. That does not include the 6,000 employees who exited the organization when Burroughs' Memorex Corp. was sold to senior Memorex executives and taken private.

Through the merger, Unisys displaces Digital Equipment Corp. as the second largest computer manufacturer after IBM. It will generate about $10.5 billion in 1986, has $1.1 billion in operating income and $700 million in research and development funding.

The company will be able to combine Burroughs' expertise in banking and finance with Sperry's strengths in the federal and military sectors. But it is faced with maintaining dual systems into the foreseeable future.

Bozman is a Computerworld *correspondent based in Chicago.*

IBM will close parts center

From page 146

fers often amount to a sort of unforced layoff.

"They are stretching the limits of the no-layoff policy," Milunovich said. "When you tell someone in California that he can stay with the company if he moves to New York, that person is likely to leave."

Earlier this year, IBM announced the closing of a federal sales office in Westlake Village, Calif., resulting in the transfer of almost 500 workers. That marked IBM's first closing of a facility since 1984, when it shut a manufacturing plant employing 250 in Washington, D.C.

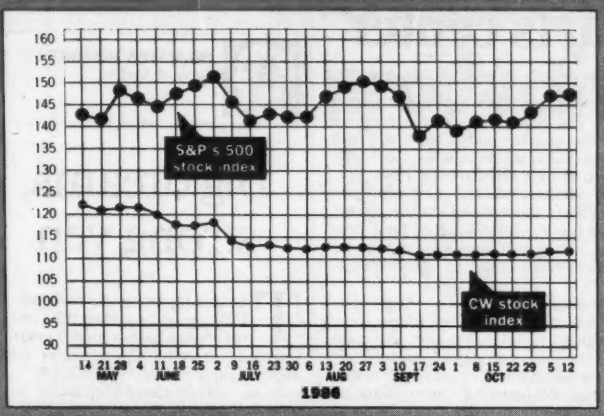
IBM has been a presence in Greencastle, Ind., since 1953 and is the largest employer in the town of 8,400. The company plans to donate the 350,000-sq-ft facility to the town, offer a $1.5 million grant to replace lost property tax revenue and assign a full-time executive to help Greencastle attract new business to use the facility.

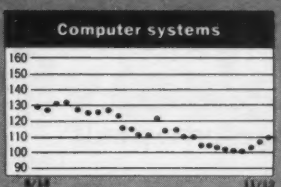
In addition to distribution, the Greencastle facility handled parts sales, service repair and associated planning, accounting and MIS functions.

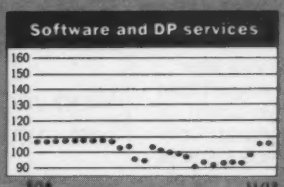
COMPUTER INDUSTRY

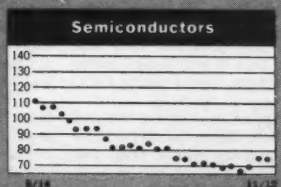
MITCHELL J. HAYES

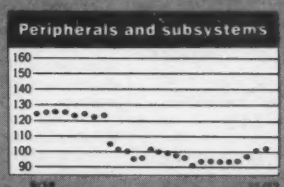
Computerworld stock trading index











All indexes reflect a historical base of 100 on Dec. 31, 1984, and trace stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

	11/5/86	11/12/86
Computer systems	108.9	**110.6**
Software and DP services	107.2	**107.5**
Peripherals and subsystems	101.9	**103.2**
Supplies and accessories	134.3	**134.9**
Semiconductors	75.2	**74.9**
Leasing companies	96.0	**92.4**
CW stock index	112.2	**112.2**
Standard and Poor's 500 stock index	147.4	**147.5**

Computerworld stock trading index

CLOSING PRICES WEDNESDAY, NOVEMBER 12, 1986

COMPUTER SYSTEMS

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE NOV 12 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	8	4	4.88	-0.3	-4.9
O	ALTOS COMPUTER SYS	19	10	10.38	+0.4	+3.8
A	AMDAHL CORP	23	11	21.63	-0.3	-1.1
O	APOLLO COMPUTER INC	18	9	12.88	+0.0	+0.0
O	APPLE COMPUTER INC	39	19	36.63	-0.4	-1.0
N	AT&T	26	21	25.63	+0.1	+0.5
O	C P T CORP	7	3	3.31	+0.2	+6.0
N	COMPAQ COMPUTER CORP	18	10	16.38	-0.4	-2.2
A	COMPUTER CONSOLES INC	12	6	9.50	+0.0	+0.0
O	CONCURRENT COMP CORP	25	1	15.75	+0.8	+5.0
N	CONTROL DATA CORP	29	17	25.63	-0.9	-3.3
O	CONVERGENT TECH	14	4	6.38	+0.1	+2.0
N	CRAY RESH INC	100	57	74.75	-0.3	-0.3
O	DAISY SYS CORP	32	8	9.25	+0.5	+5.7
N	DATA GEN CORP	50	25	32.50	+1.6	+5.3
N	DATAPOINT CORP	9	5	8.25	-0.1	-1.5
N	DIGITAL EQUIP CORP	105	58	102.00	-1.6	-1.6
N	ELECTRONIC ASSOC INC	7	4	4.13	+0.1	+3.1
N	FLOATING POINT SYS INC	46	11	13.00	+1.3	+10.6
N	GOULD INC	34	15	19.50	+0.3	+1.3
N	HARRIS CORP	36	25	35.50	+5.3	+17.4
N	HEWLETT PACKARD CO	50	32	41.13	-0.9	-2.1
N	HONEYWELL INC	87	62	72.88	-1.1	-1.5
N	IBM	162	119	122.75	-0.4	-0.3
O	IPL SYS INC	4	1	2.13	+0.0	+0.0
N	ITT CORP	60	33	54.75	+0.0	+0.0
N	M A COM INC	19	12	12.25	+0.3	+2.1
N	MATSUSHITA ELEC INDL LTD	118	55	112.00	+4.1	+3.8
O	MENTOR GRAPHICS CORP	21	11	17.25	+0.1	+0.7
N	MOHAWK DATA SCI CORP	4	1	2.50	+0.1	+5.3
N	NBI INC	14	8	10.00	+2.4	+31.1
N	NCR CORP	57	36	46.00	-1.5	-3.2
N	PRIME COMPUTER INC	28	16	15.88	-1.8	-9.9
N	SPERRY CORP	77	47	75.75	+0.0	+0.0
O	STRATUS COMPUTER	26	17	21.00	+0.3	+1.2
O	SYMBOLICS INC	16	4	4.50	+0.3	+5.9
O	TANDEM COMPUTERS INC	40	18	36.63	-1.5	-3.9
N	TANDY CORP	45	31	40.50	-0.8	-1.8
N	TEXAS INSTRS INC	148	95	116.00	-0.6	-0.5
A	ULTIMATE CORP	35	13	17.63	-0.6	-3.4
N	UNISYS CORP	80	58	77.25	-0.6	-0.8
A	WANG LABS INC - B	23	11	11.88	-0.1	-1.0
A	WANG LABS INC - C	23	11	12.00	+0.1	+1.1
N	XEROX CORP	72	49	58.00	+0.0	+0.0

SUPPLIES & ACCESSORIES

N	AMER BUSINESS PRODS	37	25	25.50	-0.8	-2.9
N	BARRY WRIGHT CORP	25	15	15.50	+0.0	+0.0
A	DUPLEX PRODS INC	23	18	18.63	-0.6	-3.2
N	ENNIS BUSINESS FORMS INC	28	19	25.00	+0.9	+3.6
N	3M CO	116	79	111.75	+2.5	+2.3
N	MOORE LTD	28	19	20.75	-0.8	-3.5
O	STANDARD REGISTER CO	50	32	35.00	+1.5	+4.5
N	WALLACE COMPUTER SVCS	50	37	43.00	+1.0	+2.4

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER; S=SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & DP SERVICES

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE NOV 12 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	7	4	5.00	-0.1	-2.4
N	ADVANCED SYS INC	19	12	15.38	+0.5	+3.4
N	AGS COMPUTERS INC	25	17	24.25	+1.0	+4.3
O	AMERICAN MGMT SYS INC	20	11	18.50	+0.3	+1.4
O	AMERICAN SOFTWARE INC	16	9	15.75	+1.4	+9.6
N	ANACOMP INC	7	3	4.00	-0.3	-5.9
O	ANALYSTS INTL CORP	10	4	8.75	+1.1	+14.8
O	ASHTON TATE	43	14	40.38	-1.8	-4.2
O	ASK COMPUTER SYS INC	15	9	12.88	-0.4	-2.8
O	ASTRADYNE COMP IND	3	1	2.38	+0.0	-1.3
N	AUTOMATIC DATA PROC	39	27	37.13	+0.3	+0.7
O	COMPUTER ASSOC INTL INC	25	13	22.75	+0.0	+0.0
O	COMPUTER HORIZONS CORP	15	10	11.38	-0.1	-1.1
O	COMPUTER NETWORK TECH	10	2	4.69	-0.4	-7.4
N	COMPUTER SCIENCES CORP	40	28	39.75	+2.1	+5.6
O	COMPUTER TASK GROUP INC	19	11	12.75	-0.3	-1.9
O	COMPUTONE SYS INC	6	0	0.44	-0.1	-22.2
O	COMSHARE INC	16	10	13.75	+2.3	+19.6
N	CULLINET SOFTWARE INC	20	6	8.50	-0.1	-1.4
O	CYCARE SYS INC	17	9	8.75	+0.0	+0.0
O	DUQUESNE SYS INC	33	14	33.50	-0.5	-1.5
N	GENERAL ELEC CO	83	63	78.25	-0.8	-0.9
N	GENERAL MTRS CORP	50	30	32.13	-0.9	-2.7
N	GTE CORP	64	41	62.63	+0.3	+0.4
O	HOGAN SYS INC	12	6	11.00	-0.4	-3.3
O	INFORMATION SCIENCES INC	4	1	2.00	+0.0	+0.0
O	INFOTRON SYS CORP	19	8	10.50	+0.0	+0.0
O	KEANE INC	16	6	6.00	+0.0	+0.0
N	LOGICON INC	43	24	25.50	-1.0	-3.8
O	LOTUS DEV CORP	52	19	49.75	-1.5	-2.9
O	MANAGEMENT SCI AMER	16	10	14.00	+0.3	+1.8
O	MCI COMM CORP	13	6	7.13	+0.1	+1.8
O	MICOM SYS INC	23	10	14.00	+1.3	+9.8
O	MICRO PRO INTL CORP	4	2	2.25	+0.3	+12.5
O	MICROSOFT CORP	46	26	42.75	-0.8	-1.7
O	NATIONAL DATA CORP	26	16	23.00	-0.4	-1.6
O	ON LINE SOFTWARE INT	16	6	13.50	-0.1	-0.9
O	ORACLE SYS CORP	29	13	20.50	+1.0	+5.1
N	PANSOPHIC SYS INC	36	21	31.25	-0.8	-2.3
N	PLANNING RESH CORP	31	14	31.25	+0.1	+0.4
O	POLICY MGMT SYS CORP	24	15	20.00	-0.5	-2.4
O	PROGRAMMING & SYS INC	11	6	8.50	+0.1	+1.5
O	REYNOLDS & REYNOLDS CO	42	22	29.50	-1.5	-4.8
O	SCIENTIFIC COMPUTERS INC	6	4	5.63	-0.1	-2.2
O	SEI CORP	28	15	19.63	+0.4	+1.9
O	SHARED MED SYS CORP	41	29	37.63	+1.3	+3.4
O	SOFTWARE AG SYSTEMS INC	22	15	16.38	+1.5	+10.1
O	SOFTWARE PUBG CORP	10	5	7.25	-0.1	-1.7
A	STERLING SOFTWARE INC	21	9	15.38	-0.1	-0.8
N	UCCEL CORP	26	14	22.13	-1.8	-7.3
N	URS CORP	17	10	16.75	+0.4	+2.3
O	VM SOFTWARE INC	32	18	28.38	-1.1	-3.8

SEMICONDUCTORS

N	ADVANCED MICRO DEV	34	13	15.88	-0.1	-0.8
N	ANALOG DEVICES INC	25	15	16.25	-0.8	-4.4
O	ANALOGIC CORP	16	10	10.88	-0.3	-2.2
N	APPLIED MAGNETICS CORP	20	13	15.13	+0.1	+0.8
O	AVANTEK INC	24	15	16.50	+0.5	+3.1
O	HADCO CORP	7	3	3.88	+0.1	+3.3
O	INTEL CORP	32	16	20.25	-1.0	-4.7
O	MICRO MASK INC	7	2	2.63	-0.4	-12.5
N	MOTOROLA INC	50	34	36.88	-1.5	-3.9
N	NATIONAL SEMICONDUCTOR	16	8	11.13	+0.4	+3.5
N	TERADYNE INC	30	16	19.13	+2.4	+14.2

PERIPHERALS & SUBSYSTEMS

A	AM INTL INC	9	5	6.13	-0.3	-3.9
A	ANDERSON JACOBSON INC	3	2	1.75	-0.1	-6.7
O	AST RESH INC	33	11	12.13	+0.8	+6.6
O	AUTOTROL CORP	10	6	6.63	-0.2	-2.8
O	AVANT GARDE COMPUTING	7	3	5.00	+0.5	+11.1
O	BIANCTEC INC	13	6	10.13	-0.4	-3.6
N	BOLT BERANEK & NEWMAN	48	30	41.25	-0.1	-0.3
N	CENTRONICS DATA COMP	8	4	7.50	-0.1	-1.6
A	CETEC CORP	9	5	5.50	-0.1	-2.2
A	COGNITRONICS CORP	6	2	2.50	+0.1	+5.3
N	COMPUGRAPHIC CORP	29	16	19.00	-0.3	-1.3
N	COMPUTERVISION CORP	19	10	14.88	-0.6	-4.0
N	CONRAC CORP	18	13	14.00	-0.1	-0.9
A	DATAPRODUCTS CORP	18	13	13.00	-0.3	-1.9
A	DATARAM CORP	18	6	7.25	-0.3	-3.3
O	DATA SWITCH CORP	9	5	6.63	-0.3	-3.6
O	DATUM INC	7	4	5.00	+0.5	+11.1
N	DECISION INDS CORP	15	8	9.50	-0.4	-3.8
O	ENDATA INC	8	3	6.75	+0.1	+1.9
O	EVANS & SUTHERLAND	29	18	26.25	-1.0	-3.7
N	FLOATING POINT SYS INC	46	11	13.00	+1.3	+10.6
O	GANDALF TECHNOLOGIES	8	5	6.88	+0.3	+3.8
N	GENERAL DATACOMM IND	15	8	9.13	+0.1	+1.4
N	HAZELTINE CORP	30	16	29.75	-0.1	-0.4
O	ICOT CORP	13	7	9.63	-0.1	-1.3
O	INFORMATION INTL INC	18	12	14.25	+0.5	+3.6
O	INTECOM INC	7	3	5.31	+0.0	+0.0
O	INTERLEAF INC	15	8	10.13	-0.5	-4.7
O	MEGADATA CORP	5	2	2.38	+0.0	+0.0
A	MSI DATA CORP	14	8	12.50	-0.4	-2.9
N	NASHUA CORP	28	13	23.25	+0.5	+2.2
O	NETWORK SYS CORP	25	10	13.00	+0.9	+7.2
N	NORTH AMERN PHILIPS CORP	48	35	39.13	-0.1	-0.3
N	NORTHERN TELECOM LTD	38	25	31.13	-0.9	-2.7
O	NOVELL INC	26	14	25.00	+0.0	+0.0
O	OMEX	1	0	0.38	+0.0	+0.0
N	PARADYNE CORP	11	4	4.50	+0.3	+5.9
A	PENRIL CORP	9	5	4.88	-0.5	-9.3
N	PLESSEY PLC	38	21	27.00	+1.5	+5.9
O	PRINTRONIX INC	15	11	11.88	-0.1	-1.0
O	QMS INC	16	8	14.38	-0.6	-4.2
O	RAMTEK CORP	7	3	4.75	+0.6	+15.2
N	RECOGNITION EQUIP INC	17	10	13.75	-0.8	-5.2
N	SANDERS ASSOC INC	63	29	59.88	+0.0	+0.0
O	SCAN TRON CORP	19	10	16.00	-0.3	-1.5
N	SCIENTIFIC ATLANTA INC	15	9	9.75	+0.0	+0.0
O	SEAGATE TECHNOLOGY	19	6	17.88	+0.5	+2.9
N	STORAGE TECHNOLOGY	7	1	2.50	+0.0	+0.0
O	SUN MICROSYSTEM INC	20	11	18.25	-0.9	-4.6
A	T-BAR INC	8	5	7.00	-0.3	-3.4
A	TAB PRODS CO	15	11	12.75	+0.3	+2.0
O	TANDON CORP	8	2	3.50	+1.4	+64.7
A	TEC INC	8	4	3.63	-0.4	-10.8
N	TEKTRONIX INC	70	50	67.38	-1.3	-1.8
O	TELEVIDEO SYS INC	4	2	2.13	-0.1	-5.6
N	TELEX CORP	69	49	66.00	+3.3	+5.2
N	TIMEPLEX INC	24	14	20.50	+1.6	+8.6
N	TITAN CORP	12	7	7.13	-0.1	-1.7
O	VISUAL TECHNOLOGY INC	1	0	0.63	+0.0	+4.4
O	WYSE TECH	19	11	15.13	+0.0	+0.0

LEASING COMPANIES

N	COMDISCO INC	25	12	18.38	+0.5	+2.8
N	CONTINENTAL INFO SYS	12	6	8.88	-0.1	-1.4
O	FINALCO GROUP INC	5	2	2.50	-0.3	-9.1
O	PHOENIX AMERN INC	6	2	4.38	-0.1	-2.8
O	SELECTERM INC	12	5	5.50	-0.8	-12.0
N	U.S. LEASING	46	35	45.00	-0.1	-0.3

COMPUTER INDUSTRY

INSIDE

One year after spinning off from Perkin-Elmer, Concurrent Computer is still seeking a way out of the hardware slump/**118**

National Semiconductor lays off another 500 workers/**119**

Siemens signs an OEM deal for Fujitsu's 3090-class mainframe/**121**

Emulex wins a round in its court battle to market DEC-compatible disk and tape controllers/**143**

INSTANT ANALYSIS

"There are a hundred explanations for why IBM is in trouble. All of them are right, but none of them are adequate."

— **Brian Jeffery, analyst, International Technology Group**

IBM will close parts center

Workers to be relocated; cost-cutting effort expands

By Clinton Wilder

GREENCASTLE, Ind. — In the most visible example to date of its major corporatewide cost-cutting program, IBM last week announced that it will close a parts distribution center employing nearly 1,000 workers.

All 985 workers at the central Indiana Information Systems Group facility will be offered other positions within IBM, but virtually all of the transfers will involve relocation. IBM will consolidate its U.S. parts distribution at its other distribution center in Mechanicsburg, Pa., while other tasks handled in Greencastle will be moved to Lexington, Ky.

The closing reflects further corporate pressure to reduce expenses in the face of IBM's shrinking profit margins and falling earnings. Big Blue's net income dropped 27% in the quarter ended Sept. 30, and some financial analysts now say IBM may not return to solid growth until 1988.

"They are accelerating their cost cuts now because things are bad and not changing," said Steven Milunovich of First Boston Corp. "They still have a ways to go to get their expenses in line to improve profitability."

IBM's expense reductions this year have included an early retirement program targeted to cut 4,000 jobs, a virtual hiring freeze, reduced capital and discretionary spending and a massive job transfer program designed to "move work to people and people to work," according to IBM Chairman John F. Akers.

So far, IBM has preserved its strict policy of not laying off workers, but analysts point out that major job changes or trans-

See **IBM** page 144

Micro vendors target federal mart

By Mitch Betts

WASHINGTON, D.C. — Several vendors of microcomputer products and services recently announced steps to beef up their attempts to sell to the federal government, a market for office systems that is expected to grow to $1.3 billion by 1991.

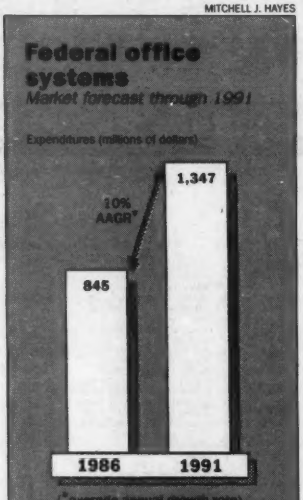
The gigantic size of the federal office-automation market and its growth potential apparently are attracting more vendor interest. The government estimates it has roughly 145,000 micros now and will have at least 500,000 by 1990 [CW, July 7].

According to Input, a Mountain View, Calif.-based research firm whose Rockville, Md., office studies the federal market, Uncle Sam's office automation market is expected to grow 10% a year, from $845 million in 1986 to $1.3 billion in 1991. In the last few weeks, vendors interested in tapping that market made the following announcements:

• Epson America, Inc. opened a Rockville,

See **MICRO** page 143

MITCHELL J. HAYES



INDUSTRY INSIGHT
James A. Martin

Big dreams, strong yen

The last Japanese attack on the U.S. was in December 1941 and involved a harbor named Pearl. Concern is growing, 45 years later, that another Japanese invasion is in the making, this one aimed at a valley named Silicon.

The recent announcement that Japan's largest computer maker, Fujitsu Ltd., is planning to acquire 80% of Silicon Valley's original chip manufacturer, Fairchild Semiconductor Corp., was just enough to push an already anxious industry into despair. Because Fujitsu is a semiconductor leader in its own country, it has the potential, with this acquisition, to become a worldwide force as well.

Depending on its outcome, this international union has left many worried that the Japanese, with their big dreams and strong yen, are extremely interested in shopping for struggling U.S. chip companies. Such a spree, it is feared, could give the Japanese a new dominance in the world chip market and, consequently, an edge in the hardware and software markets as well.

A U.S. Department of Commerce spokesman recently predicted that by the early 1990s, Japan will dominate every segment of the semiconductor market worldwide, with the possible exception of a few custom chips.

If that isn't dismal enough, the Reagan administration has expressed concern that, because Fairchild's business is in bipolar gate-array chips that wind up mainly in U.S. defense weapons, U.S.

See **BIG** page 122

Martin is a Computerworld *Southeast correspondent.*

Burroughs + Sperry = Unisys

By Jean S. Bozman

DETROIT — Unisys Corp. That name will replace all that was known as Burroughs Corp. and Sperry Corp. as of last Monday, when Chairman W. Michael Blumenthal announced the employee-chosen moniker of the world's second largest computer company.

UNISYS

From now on, all Burroughs and Sperry machines will be referred to as Unisys systems, and all signs of the two well-known corporate logos will gradually be changed to a Unisys logo during the next three years. The name change reflects the corporations' desire to be seen as a single $10.5 billion entity, not as two separate computer manufacturers that have been financially glued together.

"We are changing the name, not because we wanted to do away with the proud name and traditions of Sperry and Burroughs," Blumenthal said, "but because we wanted something new that would allow us to go forward under one umbrella." Blumenthal, however, repeated his oft-quoted assertion that Unisys will preserve the respective computer architectures of Burroughs and Sperry.

Just what will customers see from Unisys? While Unisys will not be mailing new labels for existing machines anytime soon, the Unisys name will precede all model numbers.

"The A Series will remain the A Series, and Sperry's 1100 will remain the 1100," Unisys President Paul Stern, former president and chief operating officer of Burroughs, told *Computerworld*. "Only now, they

See **BURROUGHS** page 144

Posner steps into Ansa, argues for small development teams

By Douglas Barney

LAS VEGAS — The appointment of Ronald S. Posner as head of Ansa Software Co. brings to light a debate over the optimum environment in which to develop successful software for the next generation of Microsoft Corp.'s MS-DOS, which is expected next fall.

As expected [CW, Nov. 10], Posner last week replaced Steve Dow as president and chief executive officer of micro data base vendor Ansa. Dow will return to Sevin-Rosen Management Co., the financial backer of Ansa, and pursue product acquisitions for Ansa as vice-chairman of the board.

Posner, previously executive vice-president of Ashton-Tate, argued that small development staffs are more creative in product design. He pointed to Lotus Development Corp.'s 1-2-3, the now-defunct Software Arts Inc.'s Visicalc and Ashton-Tate's Dbase II as examples of hit products produced by small development groups. "New, great software will not be developed by large development teams," Posner said last week at Comdex/Fall '86.

In contrast, Edward Esber, Ashton-Tate chairman and Posner's former boss, argued that the next generation of successful software will be complex and require a large development staff, as well as the marketing

See **POSNER** page 143

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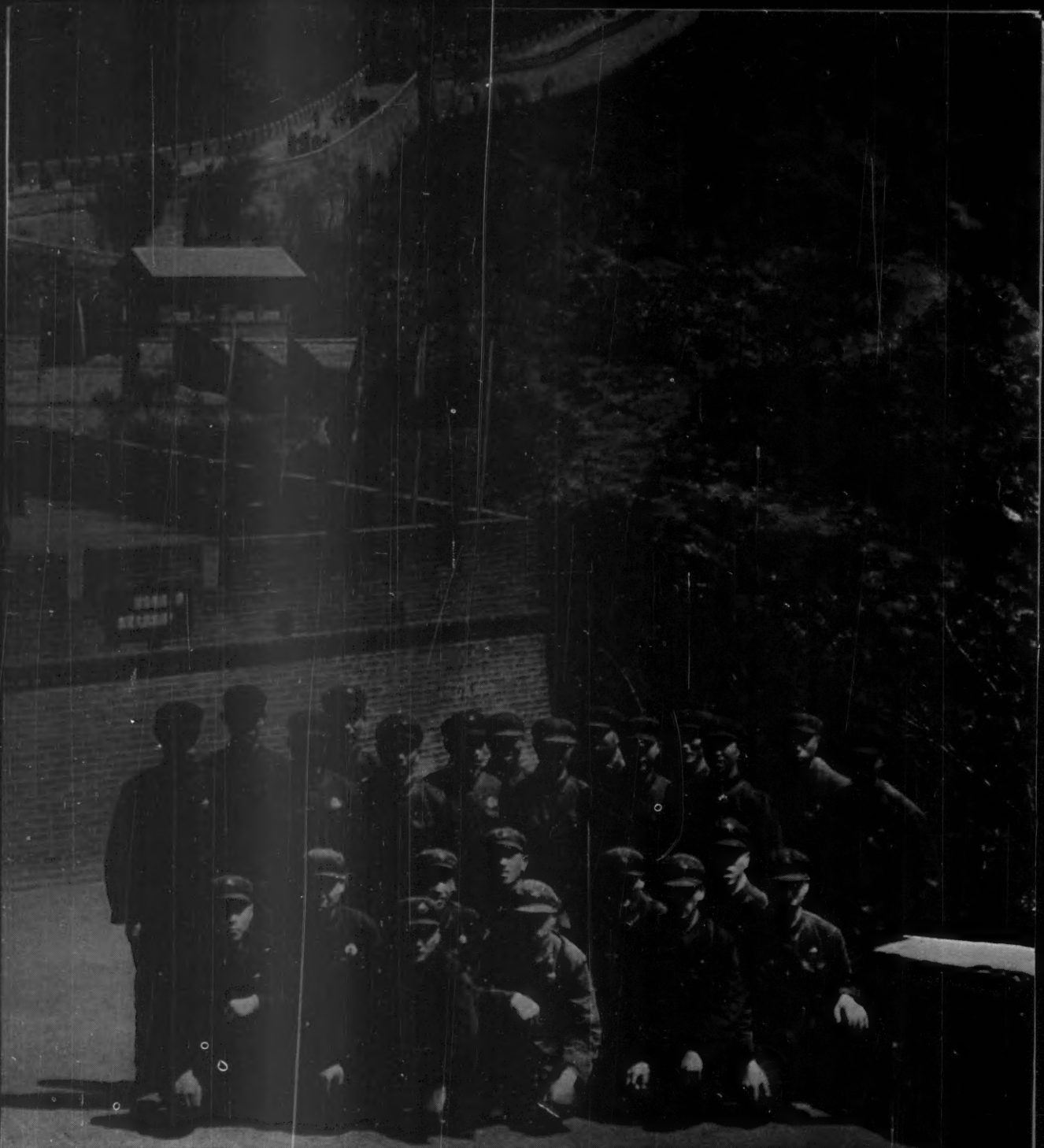

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